GE Healthcare

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GE Healthcare
LOGIQ P3 Service Manual

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Important Precautions

- **THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.**
- **IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.**

WARNING

- **DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.**
- **FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.**

- **CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.**
- **SI LE PRESTATAIRE DE SERVICES DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, IL INCOMBE AU CLIENT DE LE FAIRE TRADUIRE.**

AVERTISSEMENT

- **NE PAS TENTER D'INTERVENTION SUR LES ÉQUIPEMENTS TANT QUE LE MANUEL DE MAINTENANCE N'A PAS ÉTÉ CONSULTÉ ET COMPRIS.**
- **LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAÎNER CHEZ LE TECHNICIEN, L'OPÉRATEUR OU LE PATIENT DES BLESSURES DUES À DES DANGERS ÉLECTRIQUES, MÉCANIQUES OU AUTRES.**

- **DIESES KUNDENDIENST-HANDBUCH EXISTIERT NUR IN ENGLISCHER SPRACHE.**
- **FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENÖTIGT, IST ES AUFGABE DES KUNDEN, FÜR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.**

WARNUNG

- **WARTEN SIE DIESES GERÄT NUR, WENN SIE DIE ENTSPRECHENDEN ANWEISUNGEN IM KUNDENDIENST-HANDBUCH GELESEN HABEN UND NACHVOLLZIEHEN KÖNNEN.**
- **WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.**

AVISO

- **ESTE MANUAL DE SERVICIO SÓLO ESTÁ DISPONIBLE EN INGLÉS.**
- **SI ALGÚN PROVEEDOR DE SERVICIOS AJENO A GEMS SOLICITA UN IDIOMA QUE NO SEA EL INGLÉS, LA TRADUCCIÓN ES RESPONSABILIDAD DEL CLIENTE.**
- **NO SE DEBERÁ DAR SERVICIO TÉCNICO AL EQUIPO SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.**
- **LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL USUARIO O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR DESCARGAS ELÉCTRICAS, PROBLEMAS MECÁNICOS O PELIGROS DE OTRA NATURALEZA.**

ATENÇÃO

- **ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.**
- **SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEMS, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.**
- **NÃO TENTE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.**
- **O NÃO CUMPRIMENTO DESTE AVISO PODE PÔR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.**

AVVERTENZA

- **IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.**
- **SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEMS RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE È TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.**
- **SI PROCEDA ALLA MANUTENZIONE DELL'APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.**
- **NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL'ADDETTO ALLA MANUTENZIONE, ALL'UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.**

HOIATUS

- **KÄESOLEV TEENINDUSJUHEND ON SAADAVAL AINULT INGLISE KEELES.**
- **KUI KLIENDITEENINDUSE OSUTAJA NÕUAB JUHENDIT INGLISE KEELEST ERINEVAS KEELES, VASTUTAB KLIENT TÕLKETEENUSE OSUTAMISE EEST.**
- **ÄRGE ÜRITAGE SEADMEID TEENINDADA ENNE EELNEVALT KÄESOLEVA TEENINDUSJUHENDIGA TUTVUMIST JA SELLEST ARU SAAMIST.**
- **KÄESOLEVA HOIATUSE EIRAMINE VÕIB PÕHJUSTADA TEENUSEOSUTAJA, OPERAATORI VÕI PATSIENDI VIGASTAMIST ELEKTRILÖÖGI, MEHAANILISE VÕI MUU OHU TAGAJÄRJEL.**

VAROITUS

- **TÄMÄ HUOLTO-OHJE ON SAATAVILLA VAIN ENGLANNIKSI.**
- **JOS ASIAKKAAN PALVELUNTARJOAJA VAATII MUUTA KUIN ENGLANNINKIELISTÄ MATERIAALIA, TARVITTAVAN KÄÄNNÖKSEN HANKKIMINEN ON ASIAKKAAN VASTUULLA.**
- **ÄLÄ YRITÄ KORJATA LAITTEISTOA ENNEN KUIN OLET VARMASTI LUKENUT JA YMMÄRTÄNYT TÄMÄN HUOLTO-OHJEEN.**
- **MIKÄLI TÄTÄ VAROITUSTA EI NOUDATETA, SEURAUKSENA VOI OLLA PALVELUNTARJOAJAN, LAITTEISTON KÄYTTÄJÄN TAI POTILAAN VAHINGOITTUMINEN SÄHKÖISKUN, MEKAANISEN VIAN TAI MUUN VAARATILANTEEN VUOKSI.**

ΠΡΟΕΙΔΟΠΟΙΗΣΗ

- **ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ ΔΙΑΤΙΘΕΤΑΙ ΣΤΑ ΑΓΓΛΙΚΑ ΜΟΝΟ.**
- **ΕΑΝ ΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ ΕΝΟΣ ΠΕΛΑΤΗ ΑΠΑΙΤΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕ ΓΛΩΣΣΑ ΕΚΤΟΣ ΤΩΝ ΑΓΓΛΙΚΩΝ, ΑΠΟΤΕΛΕΙ ΕΥΘΥΝΗ ΤΟΥ ΠΕΛΑΤΗ ΝΑ ΠΑΡΕΧΕΙ ΥΠΗΡΕΣΙΕΣ ΜΕΤΑΦΡΑΣΗΣ.**
- **ΜΗΝ ΕΠΙΧΕΙΡΗΣΕΤΕ ΤΗΝ ΕΚΤΕΛΕΣΗ ΕΡΓΑΣΙΩΝ ΣΕΡΒΙΣ ΣΤΟΝ ΕΞΟΠΛΙΣΜΟ ΕΚΤΟΣ ΕΑΝ ΕΧΕΤΕ ΣΥΜΒΟΥΛΕΥΤΕΙ ΚΑΙ ΕΧΕΤΕ ΚΑΤΑΝΟΗΣΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ.**
- **ΕΑΝ ΔΕ ΛΑΒΕΤΕ ΥΠΟΨΗ ΤΗΝ ΠΡΟΕΙΔΟΠΟΙΗΣΗ ΑΥΤΗ, ΕΝΔΕΧΕΤΑΙ ΝΑ ΠΡΟΚΛΗΘΕΙ ΤΡΑΥΜΑΤΙΣΜΟΣ ΣΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ, ΣΤΟ ΧΕΙΡΙΣΤΗ Ή ΣΤΟΝ ΑΣΘΕΝΗ ΑΠΟ ΗΛΕΚΤΡΟΠΛΗΞΙΑ, ΜΗΧΑΝΙΚΟΥΣ Ή ΑΛΛΟΥΣ ΚΙΝΔΥΝΟΥΣ.**

FIGYELMEZTETÉS

- **EZEN KARBANTARTÁSI KÉZIKÖNYV KIZÁRÓLAG ANGOL NYELVEN ÉRHETŐ EL.**
- **HA A VEVŐ SZOLGÁLTATÓJA ANGOLTÓL ELTÉRŐ NYELVRE TART IGÉNYT, AKKOR A VEVŐ FELELŐSSÉGE A FORDÍTÁS ELKÉSZÍTTETÉSE.**
- **NE PRÓBÁLJA ELKEZDENI HASZNÁLNI A BERENDEZÉST, AMÍG A KARBANTARTÁSI KÉZIKÖNYVBEN LEÍRTAKAT NEM ÉRTELMEZTÉK.**
- **EZEN FIGYELMEZTETÉS FIGYELMEN KÍVÜL HAGYÁSA A SZOLGÁLTATÓ, MŰKÖDTETŐ VAGY A BETEG ÁRAMÜTÉS, MECHANIKAI VAGY EGYÉB VESZÉLYHELYZET MIATTI SÉRÜLÉSÉT EREDMÉNYEZHETI.**

VIÐVÖRUN

- **ÞESSI ÞJÓNUSTUHANDBÓK ER EINGÖNGU FÁANLEG Á ENSKU.**
- **EF ÞJÓNUSTUAÐILI VIÐSKIPTAMANNS ÞARFNAST ANNARS TUNGUMÁLS EN ENSKU, ER ÞAÐ Á ÁBYRGÐ VIÐSKIPTAMANNS AÐ ÚTVEGA ÞÝÐINGU.**
- **REYNIÐ EKKI AÐ ÞJÓNUSTA TÆKIÐ NEMA EFTIR AÐ HAFA SKOÐAÐ OG SKILIÐ ÞESSA ÞJÓNUSTUHANDBÓK.**
- **EF EKKI ER FARIÐ AÐ ÞESSARI VIÐVÖRUN GETUR ÞAÐ VALDIÐ MEIÐSLUM ÞJÓNUSTUVEITANDA, STJÓRNANDA EÐA SJÚKLINGS VEGNA RAFLOSTS, VÉLRÆNNAR EÐA ANNARRAR HÆTTU.**

VÝSTRAHA

- TENTO SERVISNÍ NÁVOD EXISTUJE POUZE V ANGLICKÉM JAZYCE.
- V PŘÍPADĚ, ŽE POSKYTOVATEL SLUŽEB ZÁKAZNÍKŮM POTŘEBUJE NÁVOD V JINÉM JAZYCE, JE ZAJIŠTĚNÍ PŘEKLADU DO ODPOVÍDAJÍCÍHO JAZYKA ÚKOLEM ZÁKAZNÍKA.
- NEPROVÁDĚJTE ÚDRŽBU TOHOTO ZAŘÍZENÍ, ANIŽ BYSTE SI PŘEČETLI TENTO SERVISNÍ NÁVOD A POCHOPILI JEHO OBSAH.
- V PŘÍPADĚ NEDODRŽOVÁNÍ TÉTO VÝSTRAHY MŮŽE DOJÍT ÚRAZU ELEKTRICKÁM PROUDEM PRACOVNÍKA POSKYTOVATELE SLUŽEB, OBSLUŽNÉHO PERSONÁLU NEBO PACIENTŮ VLIVEM ELEKTRICKÉHOP PROUDU, RESPEKTIVE VLIVEM K RIZIKU MECHANICKÉHO POŠKOZENÍ NEBO JINÉMU RIZIKU.

ADVARSEL

- DENNE SERVICEMANUAL FINDES KUN PÅ ENGELSK.
- HVIS EN KUNDES TEKNIKER HAR BRUG FOR ET ANDET SPROG END ENGELSK, ER DET KUNDENS ANSVAR AT SØRGE FOR OVERSÆTTELSE.
- FORSØG IKKE AT SERVICERE UDSTYRET MEDMINDRE DENNE SERVICEMANUAL ER BLEVET LÆST OG FORSTÅET.
- MANGLENDE OVERHOLDELSE AF DENNE ADVARSEL KAN MEDFØRE SKADE PÅ GRUND AF ELEKTRISK, MEKANISK ELLER ANDEN FARE FOR TEKNIKEREN, OPERATØREN ELLER PATIENTEN.

WAARSCHUWING

- DEZE ONDERHOUDSHANDLEIDING IS ENKEL IN HET ENGELS VERKRIJGBAAR.
- ALS HET ONDERHOUDSPERSONEEL EEN ANDERE TAAL VEREIST, DAN IS DE KLANT VERANTWOORDELIJK VOOR DE VERTALING ERVAN.
- PROBEER DE APPARATUUR NIET TE ONDERHOUDEN VOORDAT DEZE ONDERHOUDSHANDLEIDING WERD GERAADPLEEGD EN BEGREPEN IS.
- INDIEN DEZE WAARSCHUWING NIET WORDT OPGEVOLGD, ZOU HET ONDERHOUDSPERSONEEL, DE OPERATOR OF EEN PATIËNT GEWOND KUNNEN RAKEN ALS GEVOLG VAN EEN ELEKTRISCHE SCHOK, MECHANISCHE OF ANDERE GEVAREN.

BRĪDINĀJUMS

- ŠĪ APKALPES ROKASGRĀMATA IR PIEEJAMA TIKAI ANGĻU VALODĀ.
- JA KLIENTA APKALPES SNIEDZĒJAM NEPIECIEŠAMA INFORMĀCIJA CITĀ VALODĀ, NEVIS ANGĻU, KLIENTA PIENĀKUMS IR NODROŠINĀT TULKOŠANU.
- NEVEICIET APRĪKOJUMA APKALPI BEZ APKALPES ROKASGRĀMATAS IZLASĪŠANAS UN SAPRAŠANAS.
- ŠĪ BRĪDINĀJUMA NEIEVĒROŠANA VAR RADĪT ELEKTRISKĀS STRĀVAS TRIECIENA, MEHĀNISKU VAI CITU RISKU IZRAISĪTU TRAUMU APKALPES SNIEDZĒJAM, OPERATORAM VAI PACIENTAM.

ĮSPĖJIMAS

- **ŠIS EKSPLOATAVIMO VADOVAS YRA IŠLEISTAS TIK ANGLŲ KALBA.**
- **JEI KLIENTO PASLAUGŲ TEIKĖJUI REIKIA VADOVO KITA KALBA – NE ANGLŲ, VERTIMU PASIRŪPINTI TURI KLIENTAS.**
- **NEMĖGINKITE ATLIKTI ĮRANGOS TECHNINĖS PRIEŽIŪROS DARBŲ, NEBENT VADOVAUTUMĖTĖS ŠIUO EKSPLOATAVIMO VADOVU IR JĮ SUPRASTUMĖTE**
- **NEPAISANT ŠIO PERSPĖJIMO, PASLAUGŲ TEIKĖJAS, OPERATORIUS AR PACIENTAS GALI BŪTI SUŽEISTAS DĖL ELEKTROS SMŪGIO, MECHANINIŲ AR KITŲ PAVOJŲ.**

ADVARSEL

- **DENNE SERVICEHÅNDBOKEN FINNES BARE PÅ ENGELSK.**
- **HVIS KUNDENS SERVICELEVERANDØR TRENGER ET ANNET SPRÅK, ER DET KUNDENS ANSVAR Å SØRGE FOR OVERSETTELSE.**
- **IKKE FORSØK Å REPARERE UTSTYRET UTEN AT DENNE SERVICEHÅNDBOKEN ER LEST OG FORSTÅTT.**
- **MANGLENDE HENSYN TIL DENNE ADVARSELEN KAN FØRE TIL AT SERVICELEVERANDØREN, OPERATØREN ELLER PASIENTEN SKADES PÅ GRUNN AV ELEKTRISK STØT, MEKANISKE ELLER ANDRE FARER.**

OSTRZEŻENIE

- **NINIEJSZY PODRĘCZNIK SERWISOWY DOSTĘPNY JEST JEDYNIE W JĘZYKU ANGIELSKIM.**
- **JEŚLI FIRMA ŚWIADCZĄCA KLIENTOWI USŁUGI SERWISOWE WYMAGA UDOSTĘPNIENIA PODRĘCZNIKA W JĘZYKU INNYM NIŻ ANGIELSKI, OBOWIĄZEK ZAPEWNIENIA STOSOWNEGO TŁUMACZENIA SPOCZYWA NA KLIENCIE.**
- **NIE PRÓBOWAĆ SERWISOWAĆ NINIEJSZEGO SPRZĘTU BEZ UPRZEDNIEGO ZAPOZNANIA SIĘ Z PODRĘCZNIKIEM SERWISOWYM.**
- **NIEZASTOSOWANIE SIĘ DO TEGO OSTRZEŻENIA MOżE GROZIĆ OBRAŻENIAMI CIAŁA SERWISANTA, OPERATORA LUB PACJENTA W WYNIKU PORAŻENIA PRĄDEM, URAZU MECHANICZNEGO LUB INNEGO RODZAJU ZAGROŻEŃ.**

ATENȚIE

- **ACEST MANUAL DE SERVICE ESTE DISPONIBIL NUMAI ÎN LIMBA ENGLEZĂ.**
- **DACĂ UN FURNIZOR DE SERVICII PENTRU CLIENȚI NECESITĂ O ALTĂ LIMBĂ DECÂT CEA ENGLEZĂ, ESTE DE DATORIA CLIENTULUI SĂ FURNIZEZE O TRADUCERE.**
- **NU ÎNCERCAȚI SĂ REPARAȚI ECHIPAMENTUL DECÂT ULTERIOR CONSULTĂRII ŞI ÎNȚELEGERII ACESTUI MANUAL DE SERVICE.**
- **IGNORAREA ACESTUI AVERTISMENT AR PUTEA DUCE LA RĂNIREA DEPANATORULUI, OPERATORULUI SAU PACIENTULUI ÎN URMA PERICOLELOR DE ELECTROCUTARE, MECANICE SAU DE ALTĂ NATURĂ.**

- ДАННОЕ РУКОВОДСТВО ПО ОБСЛУЖИВАНИЮ ПРЕДОСТАВЛЯЕТСЯ ТОЛЬКО НА АНГЛИЙСКОМ ЯЗЫКЕ.
- ЕСЛИ СЕРВИСНОМУ ПЕРСОНАЛУ КЛИЕНТА НЕОБХОДИМО РУКОВОДСТВО НЕ НА АНГЛИЙСКОМ ЯЗЫКЕ, КЛИЕНТУ СЛЕДУЕТ САМОСТОЯТЕЛЬНО ОБЕСПЕЧИТЬ ПЕРЕВОД.

ОСТОРОЖНО!

- ПЕРЕД ОБСЛУЖИВАНИЕМ ОБОРУДОВАНИЯ ОБЯЗАТЕЛЬНО ОБРАТИТЕСЬ К ДАННОМУ РУКОВОДСТВУ И ПОЙМИТЕ ИЗЛОЖЕННЫЕ В НЕМ СВЕДЕНИЯ.
- НЕСОБЛЮДЕНИЕ УКАЗАННЫХ ТРЕБОВАНИЙ МОЖЕТ ПРИВЕСТИ К ТОМУ, ЧТО СПЕЦИАЛИСТ ПО ТЕХОБСЛУЖИВАНИЮ, ОПЕРАТОР ИЛИ ПАЦИЕНТ ПОЛУЧАТ УДАР ЭЛЕКТРИЧЕСКИМ ТОКОМ, МЕХАНИЧЕСКУЮ ТРАВМУ ИЛИ ДРУГОЕ ПОВРЕЖДЕНИЕ.

- TÁTO SERVISNÁ PRÍRUČKA JE K DISPOZÍCII LEN V ANGLIČTINE.
- AK ZÁKAZNÍKOV POSKYTOVATEĽ SLUŽIEB VYŽADUJE INÝ JAZYK AKO ANGLIČTINU, POSKYTNUTIE PREKLADATEĽSKÝCH SLUŽIEB JE ZODPOVEDNOSŤOU ZÁKAZNÍKA.

UPOZORNENIE

- NEPOKÚŠAJTE SA VYKONÁVAŤ SERVIS ZARIADENIA SKÔR, AKO SI NEPREČÍTATE SERVISNÚ PRÍRUČKU A NEPOROZUMIETE JEJ.
- ZANEDBANIE TOHTO UPOZORNENIA MÔŽE VYÚSTIŤ DO ZRANENIA POSKYTOVATEĽA SLUŽIEB, OBSLUHUJÚCEJ OSOBY ALEBO PACIENTA ELEKTRICKÝM PRÚDOM, PRÍPADNE DO MECHANICKÉHO ALEBO INÉHO NEBEZPEČENSTVA.

- DEN HÄR SERVICEHANDBOKEN FINNS BARA TILLGÄNGLIG PÅ ENGELSKA.
- OM EN KUNDS SERVICETEKNIKER HAR BEHOV AV ETT ANNAT SPRÅK ÄN ENGELSKA ANSVARAR KUNDEN FÖR ATT TILLHANDAHÅLLA ÖVERSÄTTNINGSTJÄNSTER.

VARNING

- FÖRSÖK INTE UTFÖRA SERVICE PÅ UTRUSTNINGEN OM DU INTE HAR LÄST OCH FÖRSTÅR DEN HÄR SERVICEHANDBOKEN.
- OM DU INTE TAR HÄNSYN TILL DEN HÄR VARNINGEN KAN DET RESULTERA I SKADOR PÅ SERVICETEKNIKERN, OPERATÖREN ELLER PATIENTEN TILL FÖLJD AV ELEKTRISKA STÖTAR, MEKANISKA FAROR ELLER ANDRA FAROR.

- BU SERVİS KILAVUZU YALNIZCA İNGİLİZCE OLARAK SAĞLANMIŞTIR.
- EĞER MÜŞTERİ TEKNİSYENİ KILAVUZUN İNGİLİZCE DIŞINDAKİ BİR DİLDE OLMASINI İSTERSE, KILAVUZU TERCÜME ETTİRMEK MÜŞTERİNİN SORUMLULUĞUNDADIR.

DİKKAT

- SERVİS KILAVUZUNU OKUYUP ANLAMADAN EKİPMANLARA MÜDAHALE ETMEYİNİZ.
- BU UYARININ GÖZ ARDI EDİLMESİ, ELEKTRİK ÇARPMASI YA DA MEKANİK VEYA DİĞER TÜRDEN KAZALAR SONUCUNDA TEKNİSYENİN, OPERATÖRÜN YA DA HASTANIN YARALANMASINA YOL AÇABİLİR.

このサービスマニュアルには英語版しかありません。
ＧＥＭＳ以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。

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경고

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DAMAGE IN TRANSPORTATION

All packages should be closely examined at time of delivery. If damage is apparent write “Damage In Shipment” on ALL copies of the freight or express bill BEFORE delivery is accepted or “signed for” by a GE representative or hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

CERTIFIED ELECTRICAL CONTRACTOR STATEMENT - FOR USA ONLY

All electrical Installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE Healthcare personnel. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE’s electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE’s field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

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NOTE: THIS MANUAL IS APPLICABLE TO ALL TYPES OF LOGIQ P3 and LOGIQ P3 BT10.

1.) LOGIQ P3
2.) LOGIQ P3 PRO
3.) LOGIQ P3 EXPERT
4.) LOGIQ P3 VET

Revision History

Revision	Date	Reason for change
1	June 12, 2008	Initial Release
2	Sep 20, 2008	Updated safety information
3	Jan 09, 2009	UpdatedSafety Information
4	June 05,2009	Updated Software fru part num
5	Jan, 2011	Updated LOGIQ P3 BT10 content and images
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List of Effected Pages

Pages	Revision	Pages	Revision	Pages	Revision
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Chapter 1
Introduction

Section 1-1
Overview

1-1-1 Purpose of Chapter 1

This chapter describes important issues related to safely servicing this ultrasound machine. The service provider must read and understand all the information presented here before installing or servicing a unit.

1-1-2 Chapter Contents

Table 1-1 Contents in Chapter 1

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1-1-3 Purpose of Proprietary Manual

This Proprietary Manual provides service information for the LOGIQ P3/LOGIQ P3 BT10 Ultrasound Scanning Systems. It contains the following chapters:

1.) **Chapter 1 - Introduction:** Contains a content summary and warnings.
2.) **Chapter 2 - Pre Installation:** Contains pre-installation requirements for the LOGIQ P3/LOGIQ P3 BT10.
3.) **Chapter 3 - Installation:** Contains installation procedures.
4.) **Chapter 4 -** Contains functional checks that are recommended as part of the installation, or as required during servicing and periodic maintenance.
5.) **Chapter 5 - Components and Functions (Theory):** Contains block diagrams and functional explanations of the electronics.
6.) **Chapter 6 - Service Adjustments:** Contains instructions on how to make available adjustments to the LOGIQ P3.
7.) **Chapter 7 - Diagnostics/Troubleshooting:** Provides procedures for running diagnostic or related routines for the LOGIQ P3/LOGIQ P3 BT10.
8.) **Chapter 8 - Replacement Procedures:** Provides disassembly procedures and reassembly procedures for all changeable Field Replaceable Units (FRU).
9.) **Chapter 9 - Renewal Parts:** Contains a complete list of field replaceable parts for the LOGIQ P3/ LOGIQ P3 BT10.
10.) **Chapter 10 - Care & Maintenance:** Provides periodic maintenance procedures for the LOGIQ P3/ LOGIQ P3 BT10.

1-1-4 Typical Users of the Basic Service Manual

- Service Personnel (installation, maintenance, etc.).
- Hospital's Service Personnel
- Contractors (Some parts of Chapter 2 - Pre-Installation)

1-1-5 LOGIQ P3 Models Covered by this Manual

Table 1-2 LOGIQ P3 Model Designations

Part Number	Description
5313969	Logiq P3 EXP System INDIA 230V
5313973	Logiq P3 PRO System INDIA 230V
5313974	Logiq P3 BW System INDIA 230V
5313976	Logiq P3 EXP System JAPAN 100V
5313977	Logiq P3 PRO System JAPAN 100V
5313978	Logiq P3 BW System JAPAN 100V
5313979	Logiq P3 EXP System CHINA 230V
5313980	Logiq P3 PRO System CHINA 230V
5313981	Logiq P3 BW System CHINA 230V
5313982	Logiq P3 EXP System CHILE/KOREA 230V
5313983	Logiq P3 PRO System CHILE/KOREA 230V
5313984	Logiq P3 BW System CHILE/KOREA 230V
5313985	Logiq P3 EXP System EUROPE 230V
5313986	Logiq P3 PRO System EUROPE 230V
5313987	Logiq P3 BW System EUROPE 230V
5313988	Logiq P3 EXP System AMERICAS 110V
5313989	Logiq P3 PRO System AMERICAS 110V
5313990	Logiq P3 BW System AMERICAS 110V
5313991	Logiq P3 EXP System AMERICAS with Higher UI height
5313992	Logiq P3 PRO System AMERICAS with Higher UI height
5313993	Logiq P3 BW System AMERICAS with Higher UI height

1-1-6 LOGIQ P3 BT10 Models

Table 1-3 LOGIQ P3 BT10 Model Designations

Part Number	Description
5368255	Logiq P3 EXP System INDIA 230V
5400135	Logiq P3 PRO System INDIA 230V
5400136	Logiq P3 BW System INDIA 230V
5400137	Logiq P3 EXP System CHINA 230V
5400138	Logiq P3 PRO System CHINA 230V
5400139	Logiq P3 BW System CHINA 230V
5400140	Logiq P3 EXP System CHILE/KOREA 230V
5400141	Logiq P3 PRO System CHILE/KOREA 230V
5400142	Logiq P3 BW System CHILE/KOREA 230V
5400143	Logiq P3 EXP System EUROPE 230V
5400144	Logiq P3 PRO System EUROPE 230V
5400145	Logiq P3 BW System EUROPE 230V
5400146	Logiq P3 EXP System AMERICAS 110V
5400147	Logiq P3 PRO System AMERICAS 110V
5400148	Logiq P3 BW System AMERICAS 110V

1-1-7 Purpose of Operator Manual(s)

The Operator Manual(s) should be fully read and understood before operating the LOGIQ P3 and also kept near the unit for quick reference.

Section 1-2
Important Conventions

1-2-1 Conventions Used in Book

Icons

Pictures, or icons, are used wherever they reinforce the printed message. The icons, labels and conventions used on the product and in the service information are described in this chapter.

Safety Precaution Messages

Various levels of safety precaution messages may be found on the equipment and in the service information. The different levels of concern are identified by a flag word that precedes the precautionary message. Known or potential hazards are labeled in one of following ways:

⚠ **DANGER** **DANGER IS USED TO INDICATE THE PRESENCE OF A HAZARD THAT WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF THE INSTRUCTIONS ARE IGNORED.**

⚠ **WARNING** ***WARNING IS USED TO INDICATE THE PRESENCE OF A HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY AND PROPERTY DAMAGE IF INSTRUCTIONS ARE IGNORED.***

⚠ **CAUTION** **Caution is used to indicate the presence of a hazard that will or can cause minor personal injury and property damage if instructions are ignored.**

⚠ **NOTICE** **Equipment Damage Possible**

Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk.

*Example***:** Disk drive will crash.

NOTE: Notes provide important information about an item or a procedure. Information contained in a NOTE can often save you time or effort.

1-2-2 Standard Hazard Icons

Important information will always be preceded by the exclamation point contained within a triangle, as seen throughout this chapter. In addition to text, several different graphical icons (symbols) may be used to make you aware of specific types of hazards that could cause harm.

Table 1-4 Standard Hazard Icons

ELECTRICAL	MECHANICAL	RADIATION
LASER	**HEAT**	

Other hazard icons make you aware of specific procedures that should be followed.

Table 1-5 Standard Icons Indicating a Special Procedure Be Used

AVOID STATIC ELECTRICITY	TAG AND LOCK OUT	WEAR EYE PROTECTION

1-2-3 Product Icons

The following table describes the purpose and location of safety labels and other important information provided on the equipment.

Table 1-6 Warnings

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
Identification and Rating Plate	• Manufacture's name • Date of manufacture • Model and serial numbers • Electrical ratings (Volts, Amps, phase, and frequency)	See 'Identification and Rating Plate' on page1-6 for more information.
Type/Class Label	Used to indicate the degree of safety or protection.	
IP Code (IPX1 or IPX8)	Indicates the degree of protection provided by the enclosure per IEC60 529. IPX1 cannot be used in operating room environment; IPX8 can be used in operating room environment.	Bottom of Footswitch
	Equipment Type BF (man in the box symbol) IEC 878-02-03 indicates B Type equipment having a floating applied part.	Probe and PCG marked Type BF
	ATTENTION - Consult accompanying documents is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Various
	"CAUTION - Dangerous voltage" (the lightning flash with arrowhead in equilateral triangle) is used to indicate electric shock hazards.	Rear panel and inside of console
	"Mains OFF" indicates the power off position of the mains power breaker.	See the Console Overview section for location information.
	"Mains ON" indicates the power on position of the mains power breaker.	See the Console Overview section for location information.
	"ON" indicates the power on position of the power switch. **CAUTION:** This Power Switch **DOES NOT ISOLATE** Mains Supply. "Standby" indicates the power standby position of the power switch. **CAUTION:** This Power Switch **DOES NOT ISOLATE** Mains Supply.	See the Console Overview section for location information.
	"Protective Earth" indicates the protective earth (grounding) terminal.	Internal

Table 1-6 Warnings

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	"Equipotentiality" indicates the terminal to be used for connecting equipotential conductors when interconnecting (grounding) with other equipment. Connection of additional protective earth conductors or potential equalization conductors is not necessary in most cases and is only recommended for situations involving multiple equipment in a high-risk patient environment to provide assurance that all equipment is at the same potential and operates within acceptable leakage current limits. An example of a high-risk patient would be a special procedure where the patient has an accessible conductive path to the heart such as exposed cardiac pacing leads.	Rear of console
	Alternating Current symbol is in accordance with IEC 60878-01-14.	Rear Panel, Rating Plate, Circuit breaker label of console and front panel (if applicable).
	Date of manufacture. The date could be a year, year and month, or year, month and day, as appropriate. See ISO 8601 for date formates.	Rating Plate
	Catalog or model number.	Rating Plate
	Serial number	Rating Plate
	Direct Current. For products to be powered from a DC supply.	Rating Plate
	Type CF Defib-Proof Applied Part (heart in the box with paddle) symbolis in accordance with IEC 60878-02-06.	ECG Module

Table 1-6 Warnings

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.	Rating Plate
	No hazardous substance, above the maximum concentration value, is present. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE).	
	Indicates the presence of hazardous substance(s) above the maximum concentration value. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). "20" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in any severe environmental pollution, bodily injury, or damage to any assets.	Rear Panel
	DO NOT place a finger, hand or any object on the joint of the monitor or monitor arm to avoid injury when moving the monitor and monitor arm.	Rear of the LCD monitor
	Do not use the following devices near this equipment: cellular phone, radio receiver, mobile radio transmitter, radio controlled toy, broadband power lines, etc. Use of these devices near this equipment could cause this equipment to perform outside the published specifications. Keep power to these devices turned off when near this equipment.	

Table 1-6 Warnings

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
"CAUTION This unit weighs 80 kgs. Special care must be taken to avoid injury." 	This precaution is intended to prevent injury that may result if one person attempt to move the unit considerable distances or on an incline due to the weight of the unit.	On the console where easily seen during
	This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this sytem, the backlight lamps in the monitor display, contain mercury.)	Rear of LCD
	"Consult accompanying document" is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Rear cover

Section 1-3
Safety Considerations

1-3-1 Introduction

The following safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual, violates safety standards of design, manufacture and intended use of the equipment.

1-3-2 Human Safety

Operating personnel must not remove the system covers.
Servicing should be performed by authorized personnel only.
Only personnel who have participated in a LOGIQ P3 Training are authorized to service the equipment.

1-3-3 Mechanical Safety

⚠ **WARNING** ***Ultrasound probes are highly sensitive medical instruments that can easily be damaged by improper handling. Use care when handling and protect from damage when not in use. Do not use a damaged or defective probe. Failure to follow these precautions can result in serious injury and equipment damage.***

⚠ **WARNING** ***Never use a probe that has fallen to the floor. Even if it looks ok, it may be damaged.***

⚠ **CAUTION** **The LOGIQ P3 weights 80kg or more, depending on installed peripherals, when ready for use. To avoid possible injury and equipment damage:**

ALWAYS:

- **Use the handle to move the system.**
- **Do not let the system strike walls or door frame.**
- **Limit movement to a slow careful walk.**

NOTE: Special care should be taken when transporting the unit in a vehicle:

- *Before transporting, place the system in its special storage case.*
- *Ensure that the system is firmly secured while inside the vehicle.*
- *Secure system with straps or as directed otherwise to prevent motion during transport.*
- *Prevent vibration damage by driving cautiously. Avoid unpaved roads, excessive speeds, and erratic stops or starts.*
- *Push the system with needed force to move over a threshold.*

1-3-4 Electrical Safety

To minimize shock hazard, the equipment chassis must be connected to an electrical ground. The system is equipped with a three-conductor AC power cable. This must be plugged into an approved electrical outlet with protective ground.

The power outlet used for this equipment should not be shared with other types of equipment.

Both the system power cable and the power connector meet international electrical standards.

1-3-5 Labels Locations

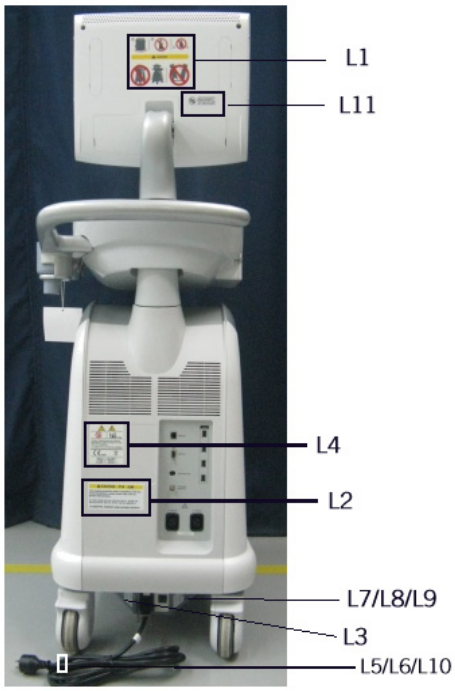

Figure 1-1 Label Location for LOGIQ P3

1-3-5 Labels Locations (cont'd)

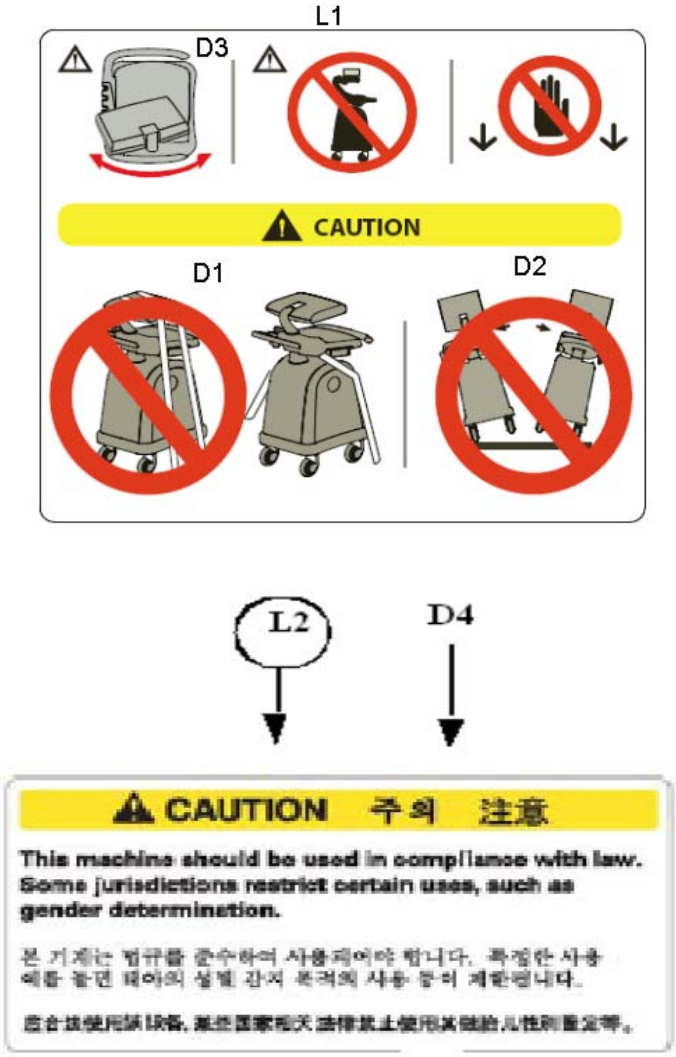
L1
D3
CAUTION
D1
D2
L2
D4
CAUTION 주의 注意
This machine should be used in compliance with law. Some jurisdictions restrict certain uses, such as gender determination.
본 기계는 법규를 준수하여 사용되어야 합니다. 특정한 사용 예를 들면 태아의 성별 감지 목적의 사용 등이 제한됩니다.

Figure 1-2 Label Location for LOGIQ P3

1-3-5 Labels Locations (cont'd)

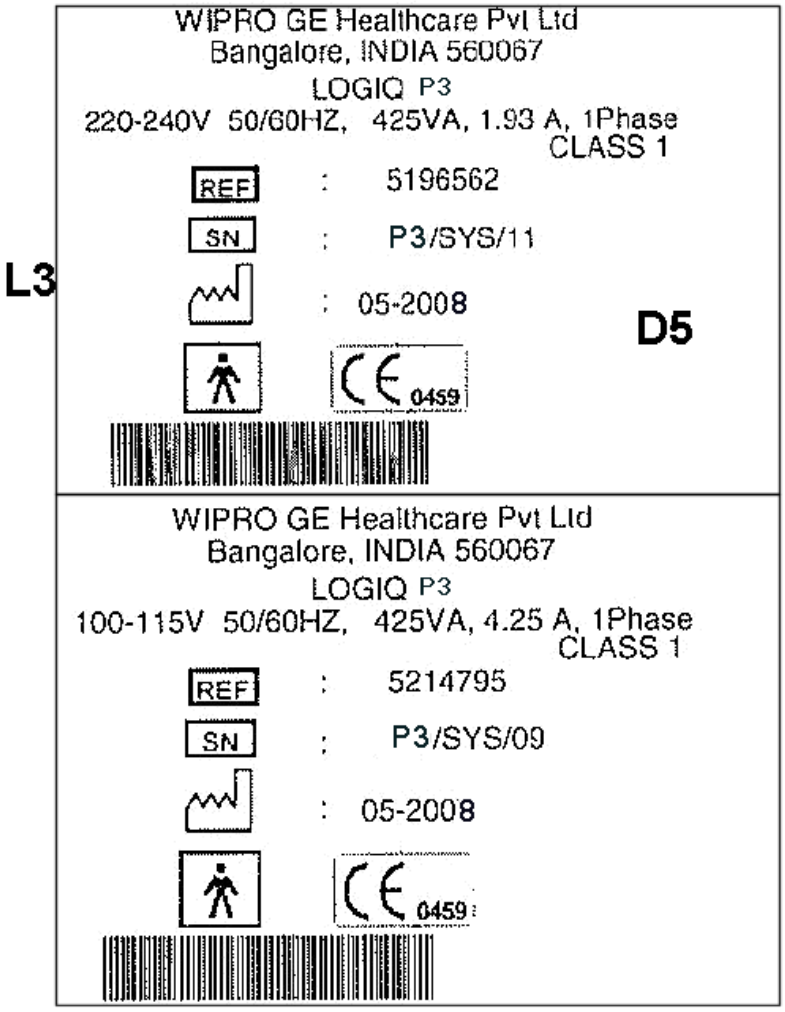

Figure 1-3 Label Location for LOGIQ P3

1-3-5 Labels Locations (cont'd)

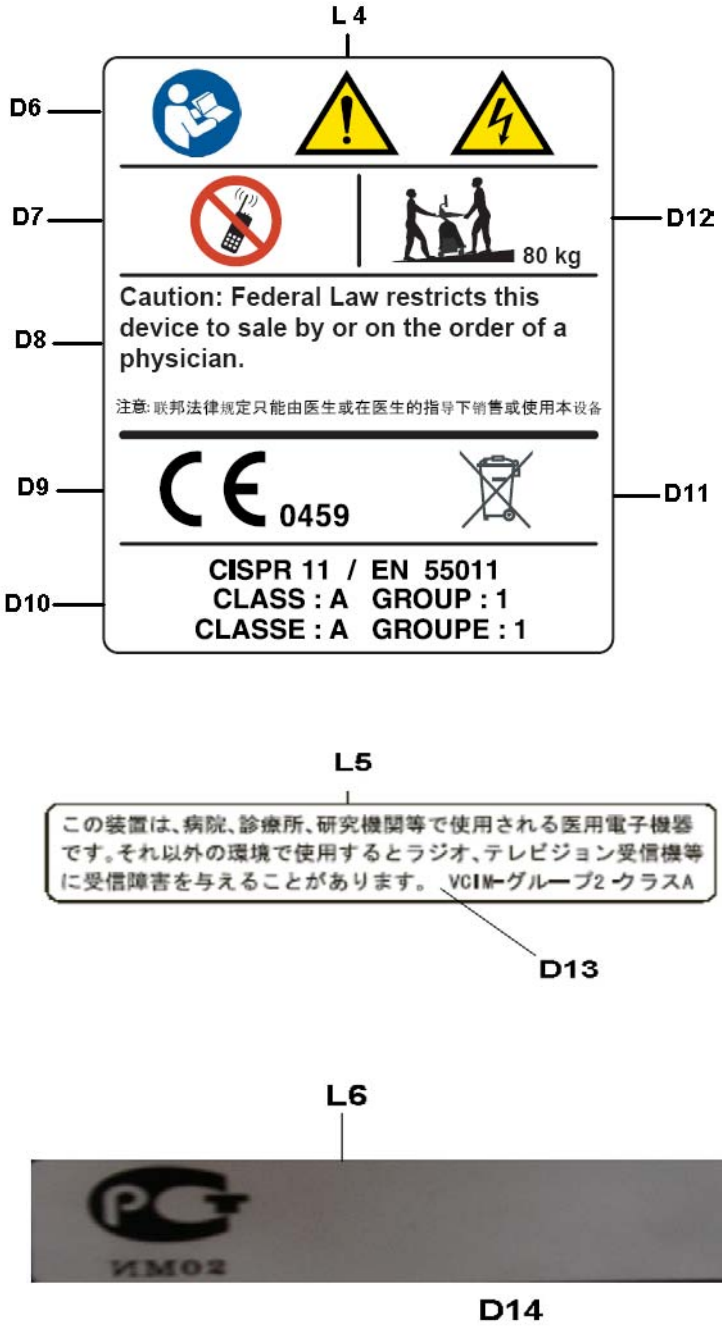

Figure 1-4

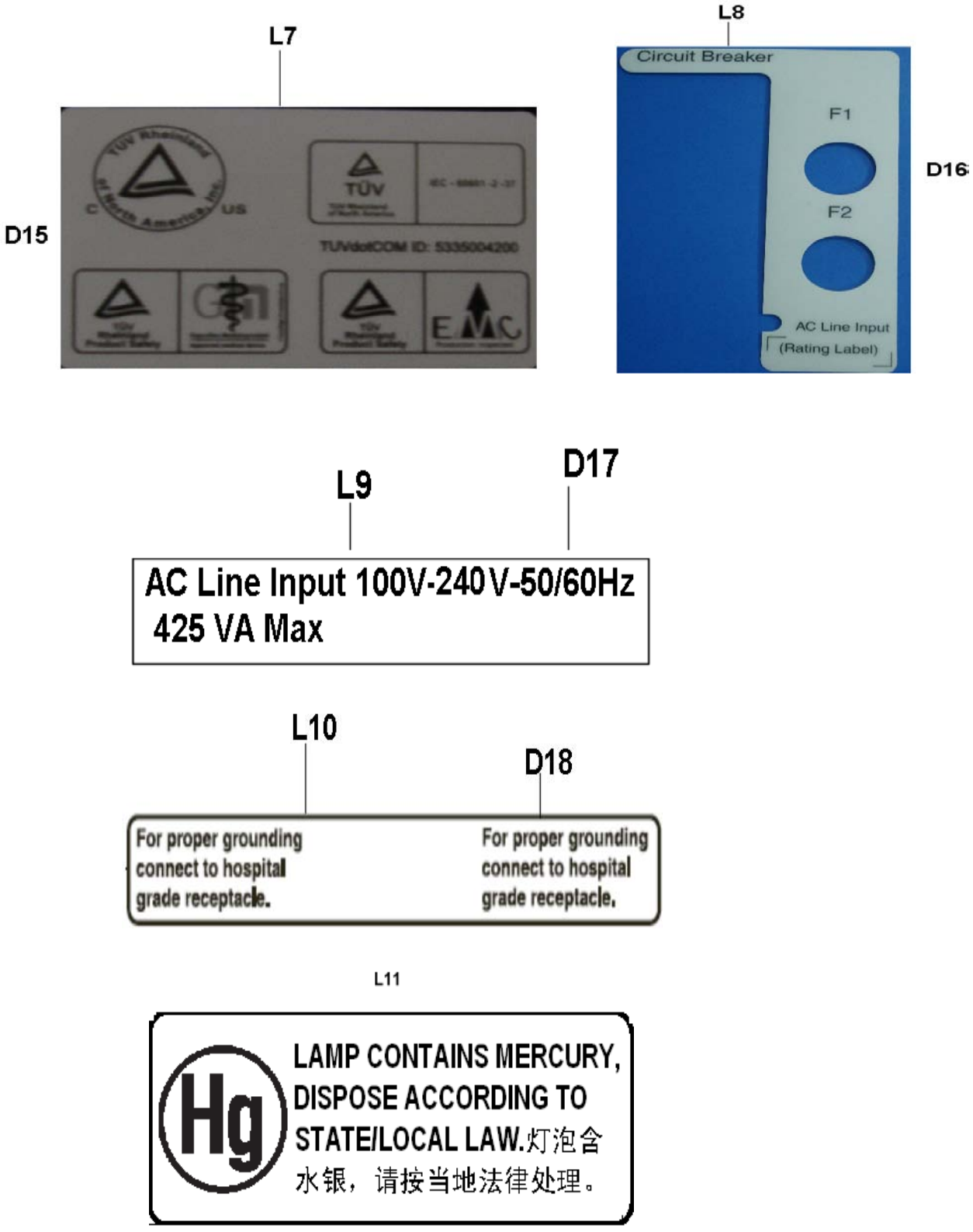
L7
D15
TÜV
TUVdotCOM ID: 5335004200
EMC
L8
Circuit Breaker
F1
F2
D16
AC Line Input
(Rating Label)
L9
D17
AC Line Input 100V-240V-50/60Hz
425 VA Max
L10
D18
For proper grounding
connect to hospital
grade receptacle.
For proper grounding
connect to hospital
grade receptacle.
L11
Hg
LAMP CONTAINS MERCURY,
DISPOSE ACCORDING TO
STATE/LOCAL LAW.灯泡含
水银，请按当地法律处理。

Figure 1-5

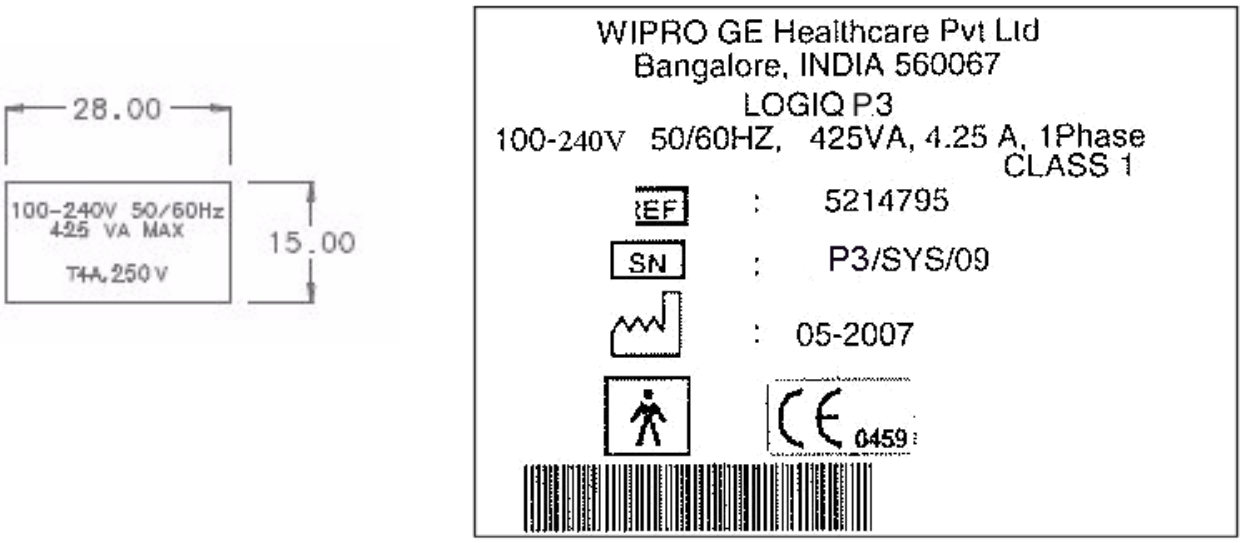

Figure 1-6 Labels (LOGIQ P3 BT10)

1-3-6 Warning labels location Table

L1 (Figure 1-2)
D1: Standard LCD monitor may rotate while transporting. Bind the system securely to prevent damage in transportation.
D2: To avoid injury by tipping over, DO NOT PUSH THIS UNIT FROM THE SIDES.
D3: DO NOT place a finger, hand or any object on the joint of the monitor or monitor arm to avoid injury when moving the monitor and monitor arm.Placing objects on top of the monitor may cause the monitor to tilt with the falling objects resulting in injury to the operator. Do not place any objects on the monitor.
L2 (Figure 1-2)
D4: This machine should be used in compliance with law. Some jurisdictions restrict certain uses, such as gender determination.
L3 (Figure 1-3)
D5: Identification and Rating Plate.
L4 (Figure 1-4)
D6: “Consult accompanying document” is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label. Possible shock hazard. Do not remove covers or panels. No user serviceable parts are inside. Refer servicing to qualified service personnel.
D7: Do not use the following devices near this equipment: cellular phone, radio receiver, mobile radio transmitter, radio controlled toy, etc. Use of these devices near this equipment could cause this equipment to perform outside the published specifications. Keep power to these devices turned off when near this equipment.
D8: Caution: Federal law restricts this device to sale or use by or on the order of a physician.
D9: The CE Mark of Conformity indicates this equipment conforms with the Council Directive 93/42/EEC
D10: CISPR CAUTION: The <systemFont>LOGIQ P3 conforms to the CISPR11, Group 1, Class A of the international standard for Electromagnetic disturbance characteristics.
D11: WEEE Label: This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.
D12: The equipment weighs approximately 80 kg (176 lbs). To avoid possible injury and equipment damage when transporting from one area of use to another:
• Be sure the pathway is clear.• Limit movement to a slow careful walk.• Use two or more persons to move the equipment on inclines or long distance.
L5 (Figure 1-4)
D13: EIAJ Label (Japan Only).
L6 (Figure 1-4)
D14: Gost Label (Russia Only).
L7 (Figure 1-5)
D15: TUV Label: TUV Listing and Certification Mark is used to designate conformance to nationally recognized product safety standards. The Mark bears the name and/or logo of the testing laboratory, product category, safety standard to which conformity is assessed, and a control number
L8 (Figure 1-5)
D16: Circuit breaker Label
L9 (Figure 1-5)
D17: Line Input voltage Label.
L10 (Figure 1-5)
D18: Signal ground point label CAUTION: This is only for “FUNCTIONAL GROUNDING”, NOT “PROTECTIVE EARTH”.
L11 (Figure 1-5)
Lamp contains Mercury Dispose According to Stete/Local Law.

1-3-7 Dangerous Procedure Warnings

Warnings, such as the examples below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

DANGER **DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT. USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.**

WARNING ***EXPLOSION WARNING***

DO NOT OPERATE THE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE. OPERATION OF ANY ELECTRICAL EQUIPMENT IN SUCH AN ENVIRONMENT CONSTITUTES A DEFINITE SAFETY HAZARD.

WARNING ***DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT***

BECAUSE OF THE DANGER OF INTRODUCING ADDITIONAL HAZARDS, DO NOT INSTALL SUBSTITUTE PARTS OR PERFORM ANY UNAUTHORIZED MODIFICATION OF THE EQUIPMENT.

WARNING ***SHUT DOWN FORCEDLY OR PLUG IN/OUT ACDC INVALID MAY CAUSE THE DAMAGE OF SYSTEM FILES.***

1-3-8 Lockout/Tagout Requirements (For USA Only)

Follow OSHA Lockout/Tagout requirements by ensuring you are in total control of the electrical Mains plug.

1-3-9 Returning/Shipping Probes and Repair Parts

Equipment being returned must be clean and free of blood and other infectious substances.

GEMS policy states that body fluids must be properly removed from any part or equipment prior to shipment. GEMS employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or an ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

NOTE: The US Department of Transportation (DOT) has ruled that "items that were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care" are "regulated medical waste" for transportation purposes and must be transported as a hazardous material.

NOTE: The USER/SERVICE staff should dispose all the waste properly as per federal, state, and local waste disposal regulation.

Section 1-4
EMC, EMI, and ESD

1-4-1 Electromagnetic Compatibility (EMC)

Electromagnetic compatibility describes a level of performance of a device within its electromagnetic environment. This environment consists of the device itself and its surroundings including other equipment, power sources and persons with which the device must interface. Inadequate compatibility results when a susceptible device fails to perform as intended due interference from its environment or when the device produces unacceptable levels of emission to its environment. This interference is often referred to as radio–frequency or electromagnetic interference (RFI/EMI) and can be radiated through space or conducted over interconnecting power of signal cables. In addition to electromagnetic energy, EMC also includes possible effects from electrical fields, magnetic fields, electrostatic discharge and disturbances in the electrical power supply.

1-4-2 CE Compliance

The LOGIQ P3 unit conforms to all applicable conducted and radiated emission limits and to immunity from electrostatic discharge, radiated and conducted RF fields, magnetic fields and power line transient requirements.

For applicable standards refer to the Safety Chapter in the Basic User Manual.

NOTE: ***For CE Compliance, it is critical that all covers, screws, shielding, gaskets, mesh, clamps, are in good condition, installed tightly without skew or stress. Proper installation following all comments noted in this service manual is required in order to achieve full EMC performance.***

1-4-3 Electrostatic Discharge (ESD) Prevention

⚠ **WARNING** ***DO NOT TOUCH ANY BOARDS WITH INTEGRATED CIRCUITS PRIOR TO TAKING THE NECESSARY ESD PRECAUTIONS:***

1. ALWAYS CONNECT YOURSELF, VIA AN ARM-WRIST STRAP, TO THE ADVISED ESD CONNECTION POINT LOCATED ON THE REAR OF THE SCANNER (TO THE RIGHT OF THE POWER CONNECTOR).

2. FOLLOW GENERAL GUIDELINES FOR HANDLING OF ELECTROSTATIC SENSITIVE EQUIPMENT.

Section 1-5
Customer Assistance

1-5-1 Contact Information

If this equipment does not work as indicated in this proprietary manual or in the User Manual, or if you require additional assistance, please contact the local distributor or appropriate support resource, as listed below.

Prepare the following information before you call:

- System ID serial number.
- Software version.

Table 1-3 Phone Numbers for Customer Assistance

Location	Phone Number	
USA GE Healthcare Ultrasound Service Engineering 9900 Innovation Drive Wauwatosa, WI 53226	Service: On-site Service: Parts Applications support	1-800–437–1171 1-800-321-7937 1-800-682-5327 or 1-262-524-5698
Canada		1-800-668-0732
Latin America	Service Applications support	1-800-321-5300 1-262-524-5698
Europe GE Ultraschall Deutschland GmbH& Co. KG BeethovenstraBe 239 Postfach 11 05 60, D-42665 Solingen Germany	OLC - EMEA Phone: +49 (0)212-2802-652 (-OLC) +33-1-3083-1300 (English/German all segments incl. training) Fax: +49 (0)212-2802-431	
Asia (Singapore) GE Ultrasound Asia Service Department - Ultrasound 298 Tiong Bahru Road #15-01/06 Central Plaza Singapore 169730	Asia ultrasound tech support ANZ +(61) 1800-647-855 China +(86) 800-810-8188 India +(91) 1-800-425-8085 Korea +(82) 2-1544-6119 SEA +(65) 6277-3444	
Japan Support Center	Phone: 81-42-648-2940 Fax: 81-42-648-2905	

1-5-2 System Manufacturer

Table 1-4 System Manufacturer

Manufacturer
Wipro GE Healthcare Pvt Ltd No:4, Kadugodi Industrial Area, Bangalore, Karnataka, INDIA - 560067. TEL: 91-80-41801000 FAX: 91-80-28452924

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Chapter 2
Pre Installation

Section 2-1
Overview

2-1-1 Purpose of this chapter 2

This chapter provides the information required to plan and prepare for the installation of a LOGIQ P3. Included are descriptions of the facility and electrical needs to be met by the purchaser of the unit.

2-1-2 Chapter Contents

Table 2-1 Contents in Chapter 2

Section	Description	Page Number
2-1	Overview	2-1
2-2	General Console Requirements	2-2
2-3	Facility Needs	2-7

Section 2-2
General Console Requirements

2-2-1 Console Environmental Requirements

Table 2-2 Environmental Requirements for LOGIQ P3 Scanners

	Operational	Storage	Transport (<16 hrs.)
Temperature	10 - 40 degrees C 50-104 degrees F	-10 to 70 degrees C 14- to 158 degrees F	-40 to 70 degrees C -40 to 158 degrees F
Humidity	30 - 85% non-condensing	30 -90% non-condensing	30 - 90% non-condensing
Pressure	700 - 1060hPa	700 - 1060hPa	700 - 1060hPa
Temperatures in degree C, conversion to degree F = (degree C*(9/5) + 32)			

Table 2-3 Environmental Requirements for an Ultrasound Room

Item	Values
Power Source	Refer to Table on page 2-3.
Radiation Shielding	NONE REQUIRED for ULTRASOUND ENERGY
Temperature	20-26 DEG. C (68-79 DEG F) for PATIENT COMFORT
Humidity	50% to 70% for PATIENT COMFORT
Heat Dissipation	1366 BTU/Hr.
Floor Landing	Approximately 680 - 800 kg/m^2 without Accessories
Floor Condition	Gradient: WITHIN 5 degrees
Weight	80 kg (176lbs) without Accessories

2-2-1-1 Cooling

The cooling requirement for the LOGIQ P3 is 1366 BTU/hr. This figure does not include cooling needed for lights, people, or other equipment in the room. Each person in the room places an additional 300 BTU/hr. demand on the cooling system.

2-2-1-2 Lighting

Bright light is needed for system installation, updates and repairs. However, operator and patient comfort may be optimized if the room light is subdued and indirect. Therefore a combination lighting system (dim/bright) is recommended. Keep in mind that lighting controls and diameters can be a source of EMI which could degrade image quality. These controls should be selected to minimize possible interface.

2-2-2 Electrical Requirements

NOTE: GE Healthcare requires a dedicated power and ground for the proper operation of its Ultrasound equipment. This dedicated power shall originate at the last distribution panel before the system.

Sites with a mains power system with defined Neutral and Live:

The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size ground wire from the distribution panel to the Ultrasound outlet.

Sites with a mains power system without a defined Neutral:

The dedicated line shall consist of one phase (two lines), not shared with any other circuit, and a full size ground wire from the distribution panel to the Ultrasound outlet.

Please note that image artifacts can occur, if at any time within the facility, the ground from the main facility's incoming power source to the Ultrasound unit is only a conduit.

2-2-2-1 LOGIQ P3 Power Requirements

Table 2-4 Electrical Specifications for LOGIQ P3

PARAMETER	AREA	LIMITS
Voltage Range (LOGIQ P3)	100-120V	100 VAC ± 10% (90-110 VAC)
	220-240V	230 VAC ±10% (207-253 VAC)
Voltage Range (LOGIQ P3 BT10)	100-240V	±10%
Power	All applications	MAX. 425VA
Line Frequency	All applications	50/60Hz (±2Hz)
Power Transients	All applications	Less than 25% of nominal peak voltage for less than 1 millisecond for any type of transient, including line frequency, synchronous, asynchronous, or aperiodic transients.
Decaying Oscillation	All applications	Less than 15% of peak voltage for less than 1 millisecond.

2-2-2-2 Inrush Current

Inrush current is not a factor to consider due to the inrush current limiting properties of the power supplies.

2-2-2-3 Site Circuit Breaker

It is recommended that the branch circuit breaker for the machine be readily accessible.

2-2-2-4 Site Power Outlets

A dedicated AC power outlet must be within reach of the unit without extension cords. Other adequate outlets for the external peripherals, medical and test equipment needed to support this unit must also be present within 1 m (3.2 ft.) of the unit. Electrical installation must meet all current local, state, and national electrical codes.

2-2-2-5 Unit Power Plug

If the unit arrives without a power plug, or with the wrong plug, you must contact your GE dealer or the installation engineer must supply what is locally required.

2-2-2-6 Power Stability Requirements

Voltage drop-out

Max 10 ms.

Power Transients

(All applications)

Less than 25% of nominal peak voltage for less than 1 millisecond for any type of transient, including line frequency, synchronous, asynchronous, or aperiodic transients.

2-2-3 EMI Limitations

Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transient in the air wiring. They also generate EMI. The LOGIQ P3 complies with limits as stated on the EMC label. However there is no guarantee that interface will not occur in a particular installation.

Possible EMI sources should be identified before the unit is installed.

Electrical and electronic equipment may produce EMI unintentionally as the result of defect.

These sources include:

- medical lasers
- scanners
- cauterizing guns
- computers
- monitors
- fans
- gel warmers
- microwave ovens
- light dimmers
- portable phones
- Lift

The presence of a broadcast station or broadcast van may also cause interference.

See Table 2-5 for EMI Prevention tips.

Table 2-5 EMI Prevention/abatement

EMI Rule	Details
Be aware of RF sources	Keep the unit at least 5 meters or 15 feet away from other EMI sources. Special shielding may be required to eliminate interference problems caused by high frequency, high powered radio or video broadcast signals.
Ground the unit	Poor grounding is the most likely reason a unit will have noisy images. Check grounding of the power cord and power outlet.
Replace all screws, RF gaskets, covers, cores	After you finish repairing or updating the system, replace all covers and tighten all screws. Any cable with an external connection requires a magnet wrap at each end. Install the shield over the front of card cage. Loose or missing covers or RF gaskets allow radio frequencies to interfere with the ultrasound signals.
Replace broken RF gaskets	If more than 20% or a pair of the fingers on an RF gasket are broken, replace the gasket. Do not turn on the unit until any loose metallic part is removed.
Do not place labels where RF gaskets touch metal	Never place a label where RF gaskets meet the unit. Otherwise, the gap created will permit RF leakage. Or, if a label has been found in such a position, move the label.
Use GE specified harnesses and peripherals	The interconnect cables are grounded and require ferrite beads and other shielding. Also, cable length, material, and routing are all important; do not change from what is specified.
Take care with cellular phones	Cellular phones may transmit a 5 V/m signal; that could cause image artifacts.
Properly dress peripheral cables	Do not allow cables to lie across the top of the card cage or hang out of the peripheral bays. Loop the excess length for peripheral cables inside the peripheral bays. Attach the monitor cables to the frame.

2-2-4 Scan Probe Environmental Requirements

Operation:10° to 40° C

Storage: 10° to 60° C

Storage: 10° to 70° C (LOGIQ P3 BT10)

*NOTE: Temperature in degrees C. Conversion to Degrees F = (Degrees C * (9/5) + 32).*

NOTICE SYSTEMS AND ELECTRONIC PROBES ARE DESIGNED FOR STORAGE TEMPERATURES OF -20 TO + 50 degrees C. WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE PRODUCT SHOULD BE KEPT IN ROOM TEMPERATURE FOR 10 HOURS BEFORE USE.

2-2-5 Time and Manpower Requirements

Site preparation takes time. Begin Pre-installation checks as soon as possible. If possible, allow six weeks before delivery, for enough time to make necessary changes.

CAUTION Have two people available to deliver and unpack the LOGIQ P3/LOGIQ P3 BT10. Attempts to move the unit considerable distances or on an incline by one person could result in injury or damage or both.

Section 2-3
Facility Needs

2-3-1 Recommended Ultrasound Room Layout

2-3-1-1 Purchaser Responsibilities

The work and materials needed to prepare the site is the responsibility of the purchaser. Delay, confusion, and waste of manpower can be avoided by completing pre installation work before delivery. User the Pre Installation checklist to verify that all needed steps have been taken,
Purchaser reasonability includes:

- Procuring the materials required.
- Completing the preparations before delivery of the ultrasound system.
- Paying the costs for any alternations and modifications not specifically provided in the sales contract.

NOTE: All electrical installation that are preliminary to the positioning of the equipment at the site prepared for the equipment must be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, products involved (and the accompanying electrical installations) are highly sophisticated and special engineering competence is required. All electrical work on these product must comply with the requirements of applicable electrical codes. The purchaser of GE equipment must only utilize qualified personnel to perform electrical servicing on the equipment.

The desire to use a non-listed or customer provided product or to place an approved product further from the system than the interface kit allows presents challenges to the installation team. To avoid delays during installation, such variances should be made known to the individuals or group performing the installation at the earliest possible date (preferable prior to purchase).
The ultrasound suite must be clean prior to delivery of the machine. Carpet is not recommended because it collects dust and creates static. Potential sources of EMI (electromagnetic interference) should also be investigated before delivery. Dirt, static, and EMI can negatively impact system.

2-3-2 Required Features

NOTE: GE Health Care Systems requires a dedicated power and ground for the proper operation of its Ultrasound equipment. This dedicated power shall originate at the last distribution panel before the system.

Sites with a mains power system with defined Neutral and Live:

The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size ground wire from the distribution panel to the Ultrasound outlet.

Sites with a mains power system without a defined Neutral:

The dedicated line shall consist of one phase (two lines), not shared with any other circuit, and a full size ground wire from the distribution panel to the Ultrasound outlet.

Please note that image artifacts can occur, if at any time within the facility, the ground from the main facility's incoming power source to the Ultrasound unit is only a conduit.

- Dedicated single branch power outlet of adequate amperage meeting all local and national codes which is located less than 2.5 m (8 ft.) from the unit’s proposed location
- Door opening is at least 76 cm (30 in) wide
- Proposed location for unit is at least 0.3m (1 ft.) from the wall for cooling
- Power outlet and place for any external peripheral are within 2 m (6.5 ft.) of each other with peripheral within 1 m of the unit to connect cables.
- Power outlets for other medical equipment and gel warmer
- Power outlets for test equipment and modem within 1 m (3.2 ft.) of unit
- Clean and protected space to store transducers (in their cases or on a rack)
- Material to safely clean probes (done with a plastic container, never metal)

2-3-3 Desirable Features

- Door is at least 92 cm (3 ft.) wide
- Circuit breaker for dedicated power outlet is easily accessible
- Sink with hot and cold water
- Receptacle for bio–hazardous waste, like used probe sheaths
- Emergency oxygen supply
- Storage for linens and equipment
- Nearby waiting room, lavatory, and dressing room
- Dual level lighting (bright and dim)
- Lockable cabinet ordered by GE for its software and proprietary manuals.

2-3-3-1 Recommended and Alternate Ultrasound Room Layout

Recommended standard floor plan and a minimal floor plan for ultrasound equipment:

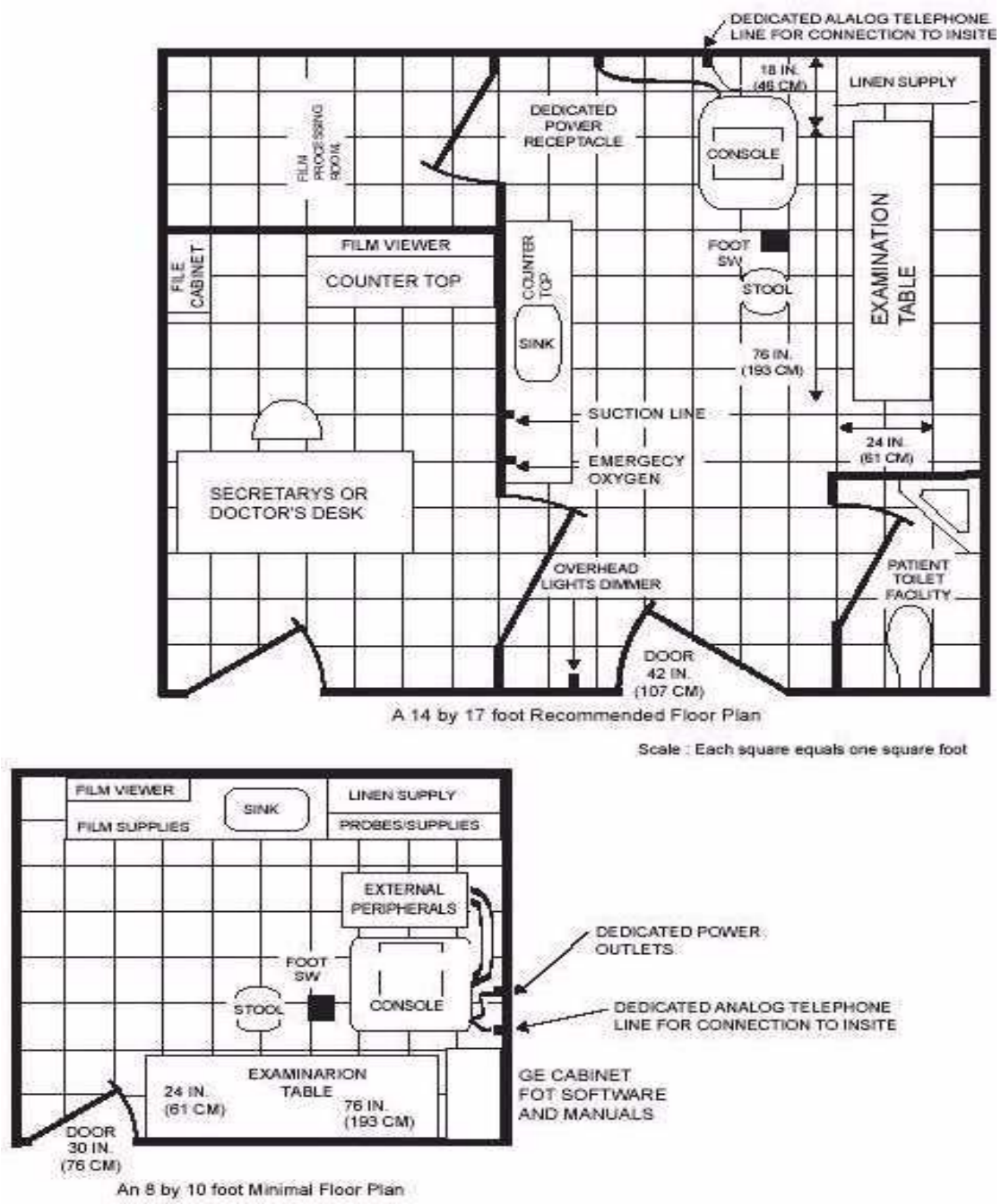

Figure 2-1 RECOMMENDED ULTRASOUND ROOM LAYOUT

2-3-4 Networking Pre-installation Requirements

2-3-4-1 Stand Alone Scanner (without Network Connection)

None.

2-3-4-2 Scanner Connected to Hospital's Network

Supported networks:

2-3-4-3 Purpose of DICOM Network Function

DICOM services provide the operator with clinically useful features for moving images and patient information over a hospital network. Examples of DICOM services include the transfer of images to workstations for viewing or transferring images to remote printers. As an added benefit, transferring images in this manner frees up the on-board monitor and peripherals, enabling viewing to be done while scanning continues. With DICOM, images can be archived, stored, and retrieved faster, easier, and at a lower cost.

2-3-4-4 DICOM Option Pre-installation Requirements

To configure the LOGIQ P3 to work with other network connections, the site's network administrator must provide some necessary information.

Information must include:

- A host name, local port number, AE Title, IP address and Net Mask for the LOGIQ P3.
- The IP addresses for the default gateway and other routers at the site for ROUTING INFORMATION.
- The host name, IP address, port and AE Title for each device the site wants connected to the LOGIQ P3 for DICOM APPLICATION INFORMATION. A field for the make (manufacturer) and the revision of the device, is also included. This information may be useful for solving errors.

2-3-4-4 DICOM Option Pre-installation Requirements (cont'd)

LOGIQ P3 **Host Name** _____ **Local Port** _____ **IP Address** ___.___.___.___

AE Title _____ **Net Mask** ___.___.___.___

ROUTING INFORMATION

	Destination IP Addresses	GATEWAY IP Addresses: Default
ROUTER1	___.___.___.___	___.___.___.___
ROUTER2	___.___.___.___	___.___.___.___
ROUTER3	___.___.___.___	___.___.___.___

DICOM APPLICATION INFORMATION

	NAME	MAKE/REVISION	AE TITLE	IP ADDRESSES	PORT
Store 1				___.___.___.___	
Store 2				___.___.___.___	
Store 3				___.___.___.___	
Store 4				___.___.___.___	
Store 5				___.___.___.___	
Store 6				___.___.___.___	
Worklist				___.___.___.___	
Storage Commit				___.___.___.___	
MPPS				___.___.___.___	

Figure 2-2 Worksheet for DICOM Network Information

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Chapter 3
Installation

Section 3-1
Overview

3-1-1 Purpose of Chapter 3

This chapter contains information needed to install the unit. Included are references to a procedure that describes how to receive and unpack the equipment and how to file a damage or loss claim.
How to prepare the facility and unit of the actual installation, and how to check and test the unit, probes, and external peripherals for electrical safety are included in this procedure. Also included in this section are guidelines for transporting the unit to a new site.

Table 3-1 Contents in Chapter 3

Section	Description	Page Number
3-1	Overview	3-1
3-2	Receiving and Unpacking the Equipment	3-3
3-3	Packing the Equipment	3-8
3-4	Preparing for Installation	3-9
3-5	Completing the Installation	3-10
3-6	System Configuration	3-15
3-6-7	Software/Option Configuration	3-27
3-7	Connectivity Installation Worksheet	3-28
3-8	Loading Base Image Software	3-29
3-9	Software Version check out	3-30
3-10	Paperwork	3-31

3-1-2 Average Installation Time

Table 3-2 Average Installation Time

Description	Average Installation Time	Comments
Unpacking the scanner	Approximately 0.5 hour	
Scanner /options	Approximately 0.5 hour	Dependent on the configuration that is required
DICOM Option	30 minutes	Dependent on the amount of configuration

The LOGIQ P3 installation and functional checkout will take approximately Four hour. LOGIQ P3 consoles with optional equipment may take slightly longer.

3-1-3 Installation Warnings

11.) Since the LOGIQ P3 weighs approximately 80 kg (176 lbs) without options, preferably two people should unpack it. Two people are also preferable for installing any additional bulky items.

12.) There are no operator serviceable components. To prevent shock, do not remove any covers or panels. Should problems or malfunctions occur, unplug the power cord. Only qualified service personnel should carry out servicing.

NOTE: For information regarding packing labels, refer to LABELS ON PACKAGE.

13.) After being transported, the unit may be very cold or hot. If this is the case, allow the unit to acclimate before you turn it on. It requires one hour for each 2.5×C increment it's temperature is below 10×C or above 40×C.

⚠ **DANGER Equipment damage possibility. Turning the system on without acclimation after arriving at site may cause the system to be damaged.**

Table 3-3 Time for Settlement

°C	60	55	50	45	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40
°F	140	131	122	113	104	96	86	77	68	59	50	41	32	23	14	5	-4	-13	-22	-31	-40
hrs	8	6	4	2	0	0	0	0	0	0	0	2	4	6	8	10	12	14	16	18	20

3-1-4 Safety Reminders

⚠ **DANGER WHEN USING ANY TEST INSTRUMENT THAT IS CAPABLE OF OPENING THE AC GROUND LINE (I.E., METER'S GROUND SWITCH IS OPEN), DON'T TOUCH THE UNIT!**

⚠ **CAUTION If the unit is very cold or hot, do not turn on its power until it has had a chance to acclimate to its operating environment.**

⚠ **DANGER To prevent electrical shock, connect the unit to a properly grounded power outlet. Do not use a three to two prong adapter. This defeats safety grounding.**

⚠ **DANGER Do not operate this unit unless all board covers and frame panels are securely in place.System performance and cooling require this.**

⚠ **DANGER OPERATOR MANUAL(S)**
The User Manual(s) should be fully read and understood before operating the LOGIQ P3 and kept near the unit for quick reference.

⚠ **DANGER ACOUSTIC OUTPUT HAZARD**
Although the ultrasound energy transmitted from the LOGIQ P3 probe is within FDA limits, avoid unnecessary exposure. Ultrasound energy can produce heat and mechanical damage

Section 3-2
Receiving and Unpacking the Equipment

When a new system arrives, check that any components are not damaged and are not in short supply. If shipping damage or shortage occurs, contact the address shown in Chapter 1.

The Packaging/Unpacking Procedure.

Topics discussed in the Packaging/Unpacking Procedure:

1.) Check the Shipment
2.) Unpack the Unit
3.) Handling Incomplete or Damaged Shipment

Please read these procedures before packing/unpacking the LOGIQ P3.

We strongly advice you to store the LOGIQ P3 packing material in undamaged condition in case of future transportation.

CAUTION **Do not lift the unit by the Keyboard. This may cause equipment damage.**

CAUTION **The crate with the LOGIQ P3 weighs approximately 80 kg. Be prepared for a sudden shift of weight as the unit is removed from its base (pallet).**

CAUTION **Inspect the Shcik watch and Tilt watch. Ensure that they are not fused. (Refer to the instructions attached on the packing Box on howto check the Shcik watch and Tiltwatch)**

1.) Cut the two Metal Bands.

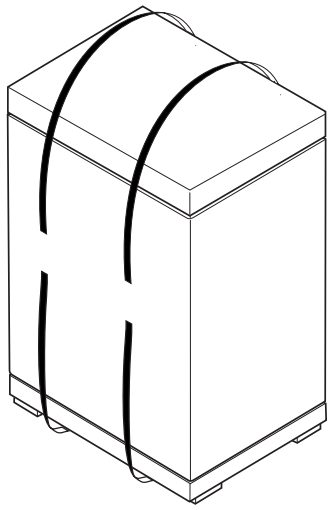


Figure 3-1 Cutting the two metal bands.

Section 3-2 Receiving and Unpacking the Equipment (cont'd)

2.) Lift the TOP Cover up and off.

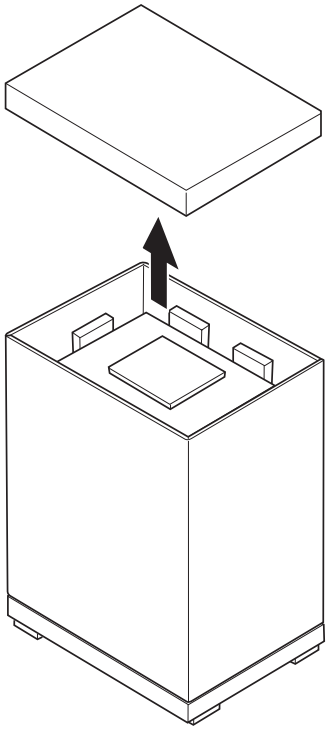


Figure 3-2 Remove the top cover

3.) Remove the Monitor Cap up and off...

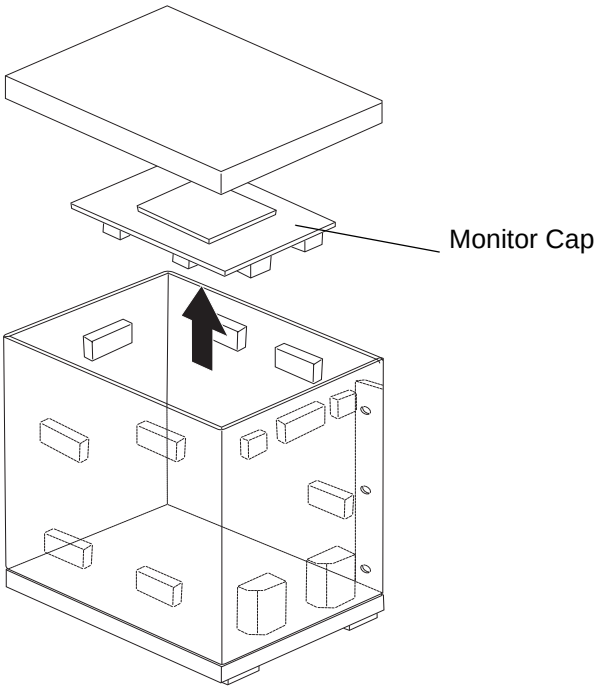


Figure 3-3 Removing the Monitor Cap

Section 3-2 Receiving and Unpacking the Equipment (cont'd)

4.) Remove the three Plastic Joints from the Outer Sleeve. (Refer to the Labels on the Packing Box for more detailed instructions)

5.) Remove the Outer Sleeve.

6.) Remove the Inner Sleeve.

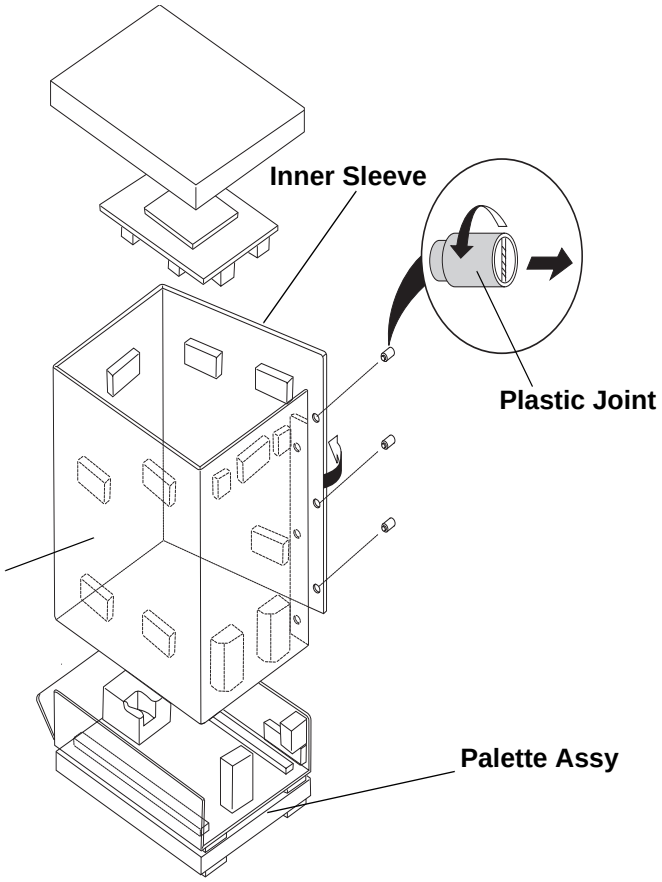


Figure 3-4 Removing Plastic Joints and Sleeves

Section 3-2 Receiving and Unpacking the Equipment (cont'd)

7.) Remove the Plastic Wrapping around the LOGIQ™ P3.
8.) Remove the Monitor Support and Monitor Packing.
9.) Remove the adhesive tapes attached at the four corners of the Top Cover.
10.) Put the Ramp Board on floor and prepare the slope to put the console down.
11.) Unlock the brakes on the front castors, then carefully put the console off the Palette.

Figure 3-5 Removing System from the Pallete

Section 3-2 Receiving and Unpacking the Equipment (cont'd)

NOTE: Check the shipping container for special instructions. Verify that the container is intact. In some cases a secondary container may be used. If so, ask the carrier for unpacking instructions.

Figure 3-6 Labels on Package

CAUTION Please carefully unpack the system, and do not dispose the package of LOGIQ P3, so that it can be reused for service.

3-2-1 Moving into Position

CAUTION Do not lift the unit by the keyboard. Use handle to move system.Do not tilt the unit more than 5 degrees to avoid tipping it over.

CAUTION Equipment Damage Possibility. Lifting the console by holding covers may damage the covers. Do not lift the console by holding any covers.

In general, a single adult can move the LOGIQ P3 along an even surface with no steep grades. At least two people should move the machine when large humps, grooves, or grades are encountered. (It is better to pull from the rear rather than push from the front of the unit). Before moving, store all loose parts in the unit. Wrap transducers in soft cloth or foam to prevent damage.

Although LOGIQ P3 is a compact and mobile machine, two people should move it over rough surfaces or up and down grades.

3-2-2 Adjusting System Clock

Set the system clock for the LOGIQ P3 to the local time. For procedure of adjusting the system clock, refer to 4-5 Software Configuration Checks, in Chapter 4, FUNCTIONAL CHECKS.

3-2-3 Product Locator Installation Card

Fill out proper customer Information on the Product Locator Installation Card. Mail this Installation Card “Product Locator” to the address corresponding to your pole.

NOTE: The Product Locator Installation Card shown may not be same as the provided Product Locator card.

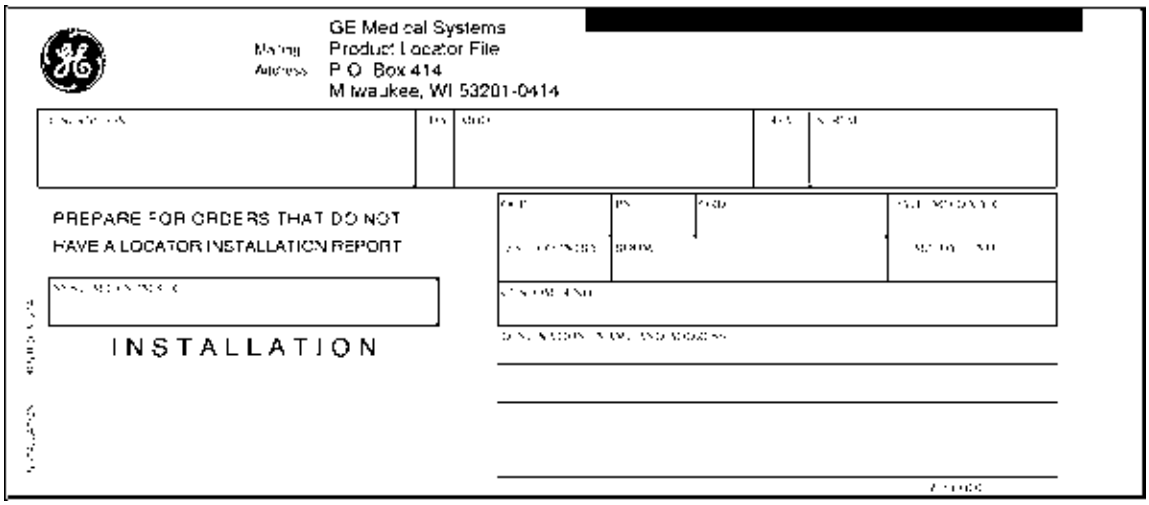


Figure 3-7 PRODUCT LOCATOR INSTALLATION CARD

Section 3-3 Packing the Equipment

Please pack LOGIQ P3 in the reverse order of unpacking.

Section 3-4
Preparing for Installation

3-4-1 Verify Customer Order

Compare items received by the customer to that which is listed on the delivery order. Report any items that are missing, back ordered or damaged.

3-4-2 Physical Inspection

3-4-2-1 System Voltage Settings

- Verify that the scanner is set to the correct voltage. The Voltage ratings for the LOGIQ P3 Scanner is found on Rating label near the Circuit Breaker at the rear of the system

WARNING ***Connecting a LOGIQ P3 scanner to the wrong voltage level will most likely destroy the scanner.***

3-4-3 EMI Protection

This Unit has been designed to minimize the effects of Electro Magnetic Interference (EMI). Many of the covers, shields, and screws are provided primarily to protect the system from image artifacts caused by this interference. For this reason, it is imperative that all covers and hardware are installed and secured before the unit is put into operation.

3-4-4 Checking the Components

When a new system arrives, check that none of the components are damaged or in short supply. If shipping damage or shortage occurs, contact the address shown in Chapter 1.

CAUTION **If the Power Plug is Modified or replaced to Suit the local Conditions and regulations, Ground continuity check should be performed between Ground Pin on the Plug and the Metal Part on the LOGIQ P3. Refer Section 10-7 for more details.**

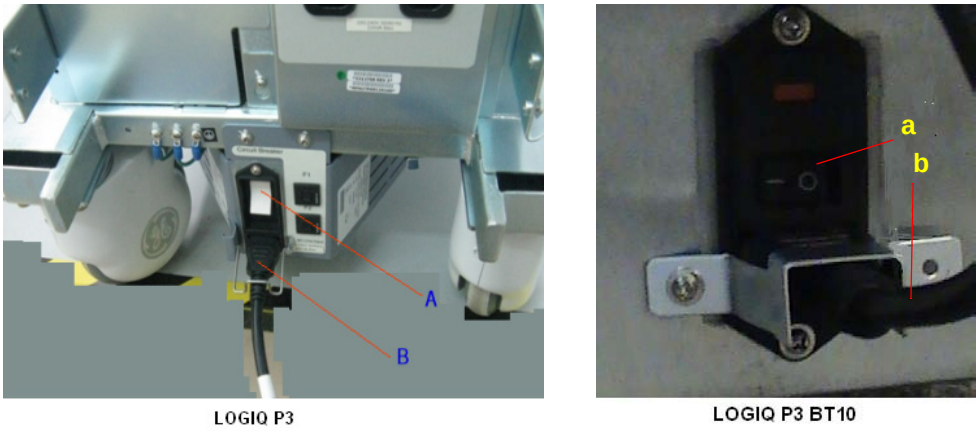
Section 3-5
Completing the Installation

3-5-1 Power On / Boot Up

NOTE: After turning off a system, wait at least twenty seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

3-5-1-1 Scanner Power On

1.) Connect the Power Cable to the back of the system.
2.) Ensure the Cable Clip slips securely over the shoulders on the molded plug.
3.) Connect the Main Power Cable to a hospital grade power receptacle with the proper rated voltage. Never use an adapter that would defeat the safety ground.
4.) Switch ON the Circuit Breaker at the rear of the system.



LOGIQ P3 LOGIQ P3 BT10

Figure 3-9 Scanner Power On

a. Circuit Breaker

b. Power Cable

When power is applied to the scanner and the rear Circuit Breaker is turned ON, power is distributed to the Transformer Assembly and to the TMST.

3-5-1-2 Turn on the system

Press the ***Power On/Off*** switch at the front of the system once.

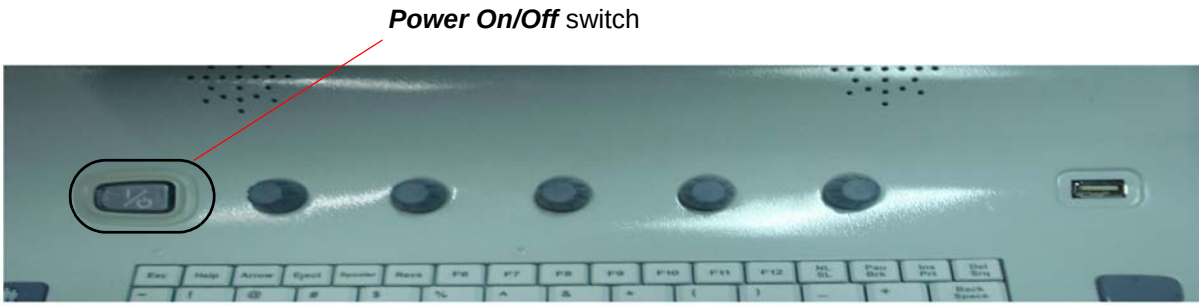


Figure 3-10 Power On/Off Switch

When the ***Power On/Off*** switch on the Control Panel is pressed once, the TMST starts and the software code is distributed to initiate the scanner.

No status messages are displayed during this process.

3-5-2 Power Off/ Shutdown

NOTE: After turning off a system, wait at least twenty seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

3-5-2-1 Back-end Processor Power Down - LOGIQ P3

To power down the system:

1.) Press the ***Power On/Off*** switch at the front of the system.
2.) The System-Exit window is displayed.

Figure 3-11 System Exit Window

3.) Using the Trackball or Select key, select Shutdown.
4.) The shutdown process takes a few seconds and is complete when the power status LED is turned Amber color.
5.) Disconnect the probes.Clean or disinfect all probes as necessary. Store them in their shipping cases to avoid damage.

3-5-2-2 Back-end Processor Power Down - LOGIQ P3 BT10

To power down the system:

1.) Press the ***Power On/Off*** switch at the front of the system.

2.) Thew System-Exit window is displayed.

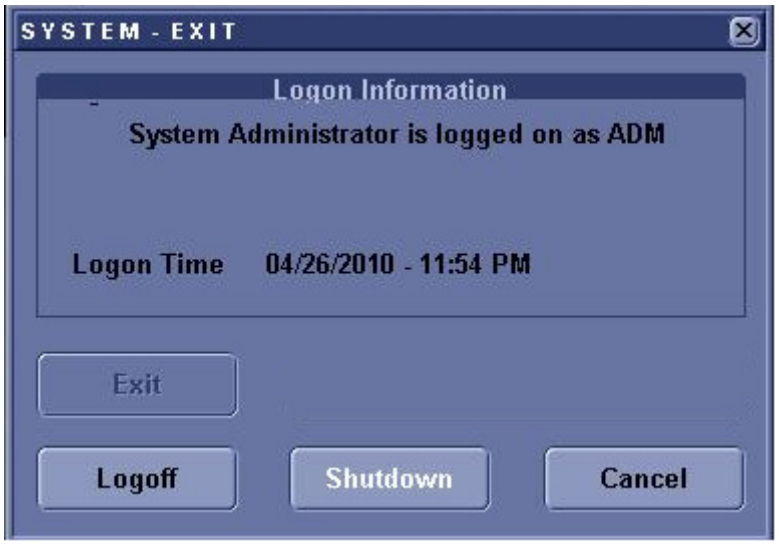


Figure 3-12 System Exit Window

3.) Using the Trackball or Select key, select Shutdown.

4.) The shutdown process takes a few seconds and is complete when the power status LED is turned Amber color.

5.) Disconnect the probes. Clean or disinfect all probes as necessary. Store them in their shipping cases to avoid damage.

3-5-2-3 Scanner Shutdown

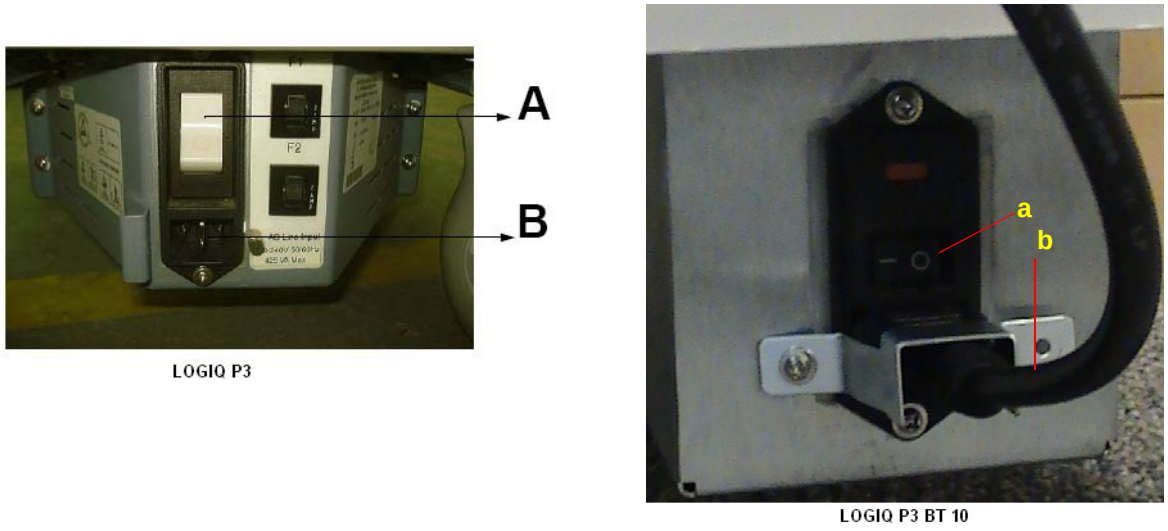


Figure 3-13 Scanner Shutdown

1.) Switch OFF the Circuit Breaker at the back of the system.
2.) Disconnect the Mains Power Cable if necessary. *For example:* Relocating the scanner.

3-5-3 Transducer Connection

1.) Connect a transducer to the upper transducer receptancle as follows:
   A.) Ensure that the transducer twist lock lever points horizontally.
   B.) Insert the transducer connector on the receptacle guide pin until it touches the receptacle mating surface.
C.) Twist the transducer lock lever vertically to lock it in place.
D.) Twist the lever to the horizontal position to disconnect the transducer.

NOTE: Please ensure that the probe latch is in unlocked position before you connect the probe to the system.

Fig (A) Connecting the Probe

Fig (B) Locking the Probe Lever

Figure 3-14 Connect the probe

NOTE: It is not necessary to turn OFF power to connect or disconnect a probe.

Section 3-6
System Configuration

3-6-1 System Specifications

3-6-1-1 Physical Dimensions

The physical dimensions of the LOGIQ P3 console are summarized in Table 3-16.

Table 3-4 Physical Dimensions of LOGIQ P3

Height	Width	Depth	Unit
1347	445	595	mm
53.0	17.5	23.4	inches

Figure 3-15 Overall Dimensions

3-6-2 Approved peripherals

Table 3-5 Approved peripherals

Device	Manufacturer	Model	H Cat	Interface
B/W Printer	SONY	UP-D897	H44492LB	USB
Digital Color Printer	SONY	UP-D23MD	H4903JT	USB
HP Color Printer	HP	HP Officejet Pro K550	H47052LW	USB
	HP	HP Laser Jet P2015dn	----------	USB
	HP	HP Office jet Pro K5400	----------	USB
	HP	HP Office jet 6000	----------	USB
	HP	HP Deskjet 460	----------	USB
	HP	HP 4360	----------	USB
	HP	HP 6940	----------	USB
3-pedal footswitch	Steute	MKF 2-MED GP26	H47042LY	USB
USB Memory	Transcend	Transcend	----------	USB
ECG	NORAV	ECG-USB1	H47042LJ	USB
DVR	Panasonic	LQ-MD800	----------	S-Video,USB
USB HDD	Iomega	USB HDD 160GB	----------	USB
HP Color Printer (LOGIQ P3 BT10)	HP	HP 470	.....	Bluetooth
Bluetooth Dongle (LOGIQ P3 BT10)	HP	BT 500	----------	Bluetooth

3-6-3 Connecting Cables

WARNING Equipment damage possibility. Be sure to use the following recommended connecting cables to connect recording devices and a network with LOGIQ P3 console.

Table 3-6 List of Connecting Cables

Name	Figure	NOTE
USB Cable		For USB ECG (3feet)
USB Cable		For USB Printer (3feet)

3-6-4 Peripherals/Accessories Connector Panel

LOGIQ P3 peripherals and accessories can be properly connected using the Rear panel.

3-6-4-1 Rear Panel Connector

Located on the Rear panel are USB Ports, VGA,S-Video,Composite Out, ethernet port & Power out let.

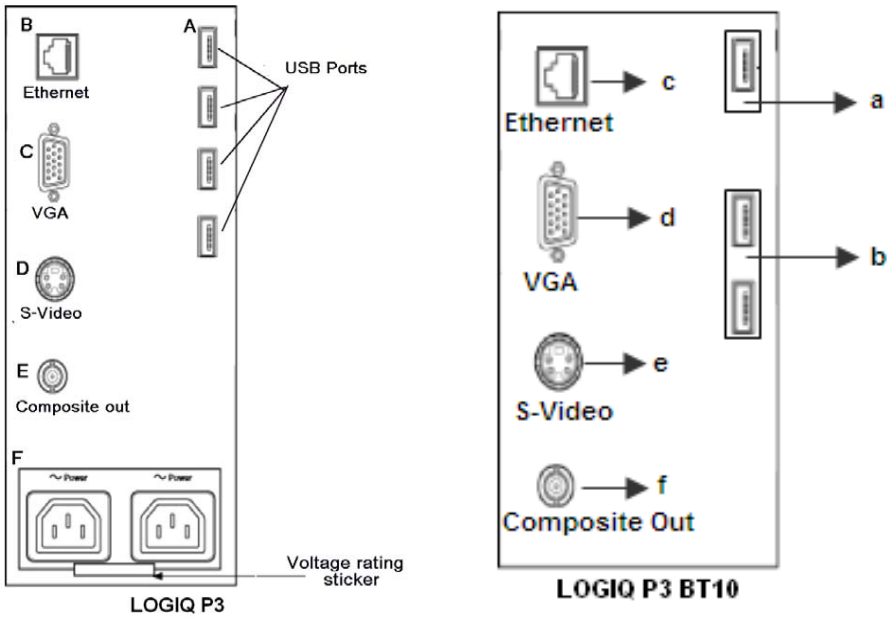


Figure 3-16 Rear Panel

NOTE: ***LOGIQ P3 BT10*** *- The printers must be connected only to the first USB port (a).*

NOTE: ***LOGIQ P3 BT10*** *- The USB dongle for Bluetooth wireless printer can be connected to any USB port available in the system except the USB port (a).*

Table 3-7 LOGIQ P3 & LOGIQ P3 BT10

LOGIQ P3	LOGIQ P3 BT10
A) USB ports for printers & ECG (B/W, Color and USB), Memory Stick, Footswitch, DVD-RW, USB HDD.	a) USB ports for printers & ECG (B/W, Color and USB), Memory Stick, Footswitch, DVD-RW, USB HDD.
B) Ethernet port	b) ECG (B/W, Color and USB), Memory Stick, Footswitch, DVD-RW, USB HDD
C) VGA Output	c) Ethernet port
D) S-Video Out	d) VGA Output
E) Composite video out	e) S-Video Out
F) Power outlet	f) Composite video out

NOTE: For the printer, bluetooth supports line of sight of approximately 10 mts.

3-6-4-2 TOP Panel Connector

Located on the Top Right side panel are one USB Port for control connections for printer, USB Thumb Drive and service tools.)

Figure 3-17 Left Side Panel

NOTICE The USB devices should be connected to LOGIQ P3 first, power on USB devices before turning LOGIQ P3 to work.

NOTE: Each outer (case) ground line of peripheral/accessory connectors are protectively grounded.

NOTE: Please scan the devices (USB Pen Drive, HDD etc,...) for virus - before using it with the system.

3-6-4-3 This section indicates the pin assignment for each connector.

1. S- Video Connector: 4 Pin, mini-Din

Table 3-8 S-Video Connector, 4 Pin

Pin No	Output Signal	Description	Picture
1	SVIDEO OUT/IN YG	Y (Luma) GND	
2	SVIDEO OUT/IN CG	C (Chroma) GND	
3	SVIDEO OUT/IN Y	Y (Luma) SIGNAL	
4	SVIDEO OUT/IN C	C (Chroma) SIGNAL	

2. Pin Assignment of USB

Table 3-9 Pin assignment of USB1

Pin No.	Signal	Pin No.	Signal
1	+5VDC	3	DATA+
2	DATA-	4	GND

Table 3-10 Pin assignment of USB2

Pin No.	Signal	Pin No.	Signal
1	+5VDC	3	DATA+
2	DATA-	4	GND

3-6-4-4 Connect peripherals

1.) Connecting B/W printer UP-D897 or Color printer UP-D23MD to the system.

Only B/W Printer UP-D897 can be mounted in Front Utility area tray as shown in figure below.

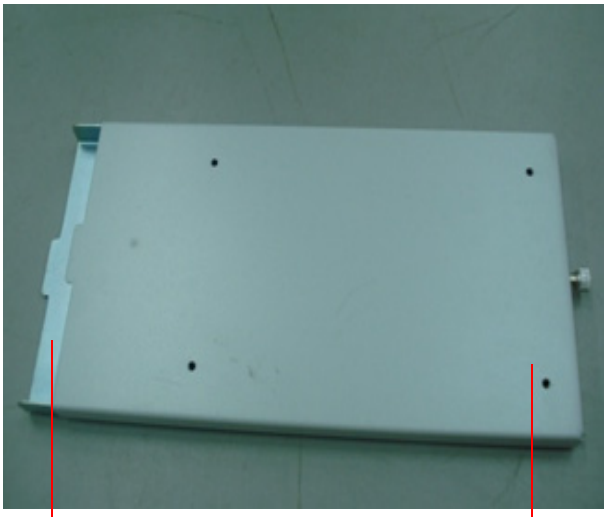


Fig (A)

VGP Tray Bottom

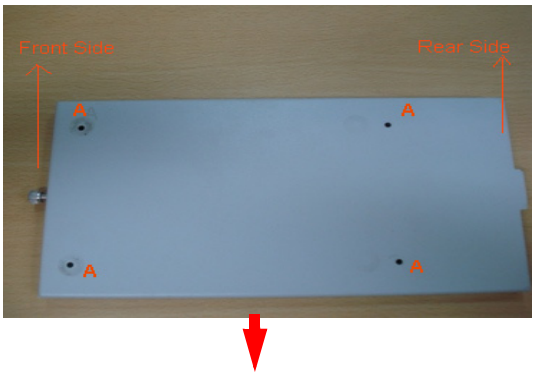
Fig (B)

VGP Tray top

Using two Captive fastener mount VGP Tray bottom to the Sytem Utility box.

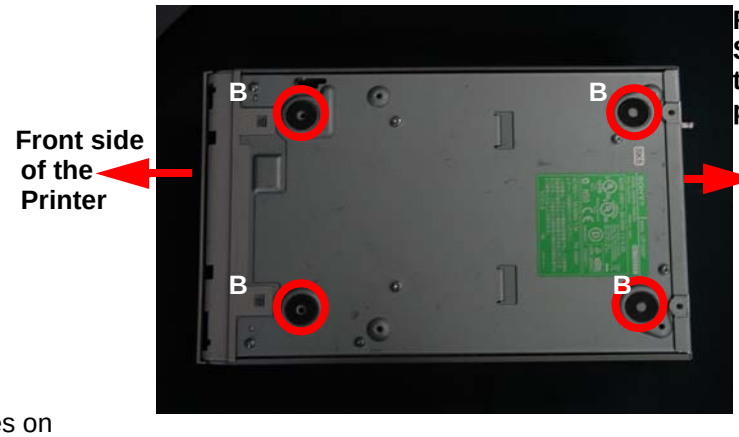
Figure 3-18 Connect B/W printer Tray to the system

2.) Mount the Sony UP-D897 printer to the VGP-UP-D 897-Mounting-Bracket using Four M3 x 8 screws as indicated below.



VGP-UP897-Mounting-Bracket(5314101)

A - Indicates the location of the mounting holes on the VGP-UP-D897-Mounting-Bracket



B - Indicates the location of the mounting holes on the Printer

Mounting the bracket to the printer by using M3X8 Screws

Figure 3-19 Mounting of VGP Tray to Printer

3.) Insert or Slide the Sony UP-D897 B/W Printer with Bracket **(Out come of Step A)** in to the Tray fixed on the System and than connect USB & Power cables in the rear side o fthe printer and push back fully & Tighten the Front captive fastener as indicated in below fig.

Figure 3-20 Mounting The Sony UPD 897 on LOGIQ P3.

4.) **Mounting Procedure for Color printer UP-D23MD:** Connect the USB Cable to any of the usb ports available on rear panel & connect the power cable to the rear panel Power port.

5.) **Connecting Foot Switch to the system**: Foot Switch USB cable can be connected to any USB Ports of the LOGIQ P3 system in the rear panel.

3-6-4-4 Connect peripherals (cont'd)

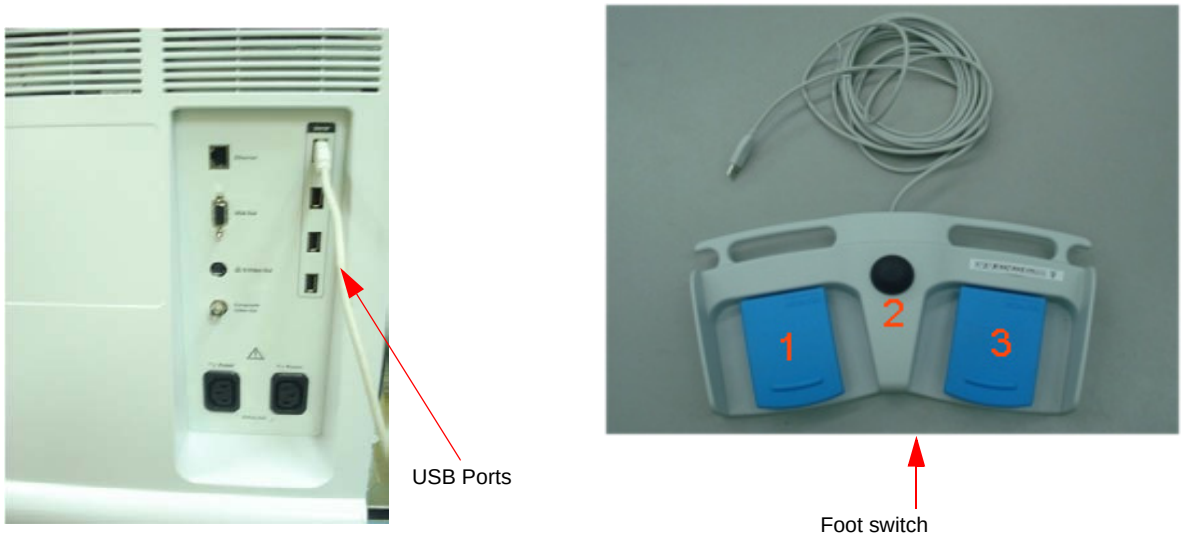


Figure 3-21 Connect Foot Switch to the system

6.) **Connecting S-Video cable to the system**: S-Video O/P is available on rear panel.

7.) **Connect the USB Memory stick to the system**: The USB Memory stick must be connected to top panel USB port or in any of the Rear panel USB Ports.

Figure 3-22 USB Memory Connection

8.) **Connecting the USB HDD to the system**: The USB Harddisk can be properly connected to Rear Panel USB ports.

9.) **Connecting the DVR to the system**: The S-Video signal, USB Cable & power cable can be properly connected using the S-Video port,USB Ports & Power Port in the Rear panel.

To activate DVR assign DVR to any of the F6 to F12 keys in Utility>admin>functional key & again Utility >System>peripherals select the respective DVR Model.Than press the respective funtion key to record the Image

.

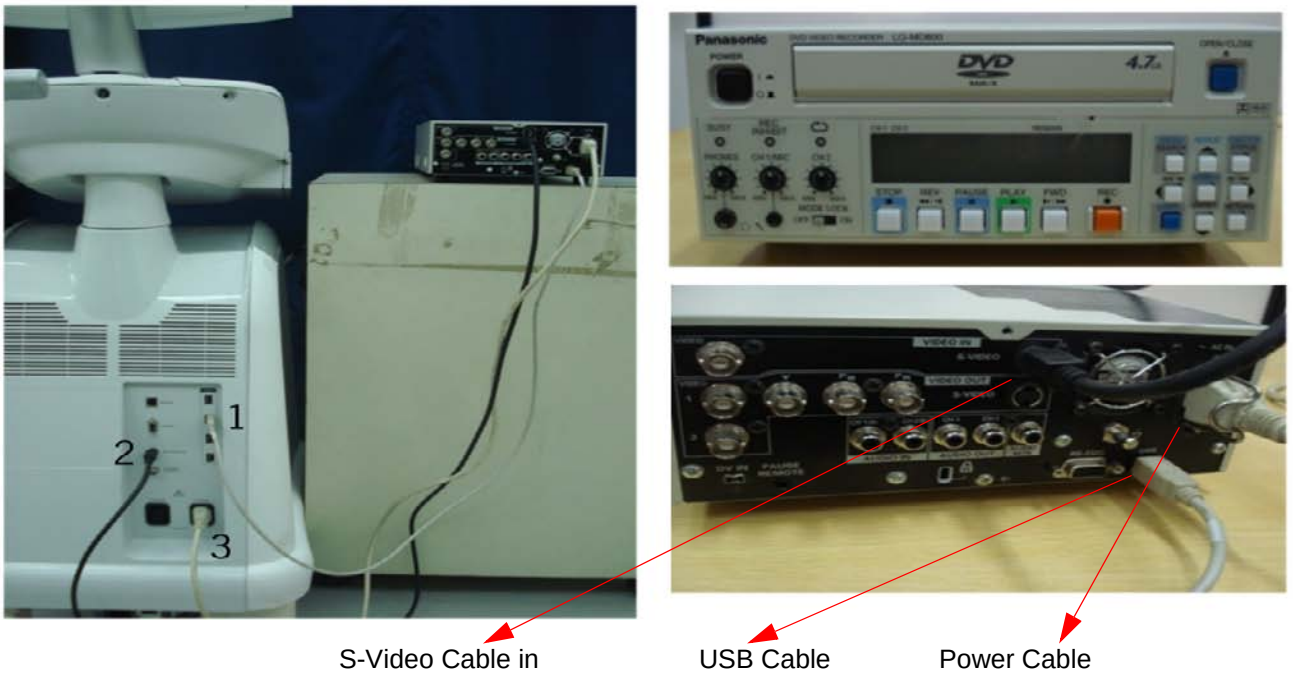


Figure 3-23 DVR Connection on the rear panel

10.) **Connecting the Color printer HP Laser jet P2015/ HP Officejet Pro K550/K5400/4360/6940 to the system:** The USB Cable & power cable can be properly connected to the USB Ports & Power Port in the Rear panel. Configure the printer from Config>Connectivity>Service>Standard print, select the respective printer.

Figure 3-24 Color Printer Connection on the rear panel

11.) **Connecting the external monitor to the system**: The monitor must be properly connected using the VGA port in the Rear panel.

Press Ctrl+Alt+V on the keyboard, a dialog box appears.

Figure 3-25 Graphics Controller Properties

Select Intel(R) Dual Display Clone; check the Same display configuration driver on both display box and select OK.

12.) **Connecting USB Bluetooth Printers (LOGIQ P3 BT10)**: Connect one USB bluetooth dongle to the LOGIQ P3 BT10 system and another USB bluetooth dongle to the HP printer and configure the printer in the Utility screen.

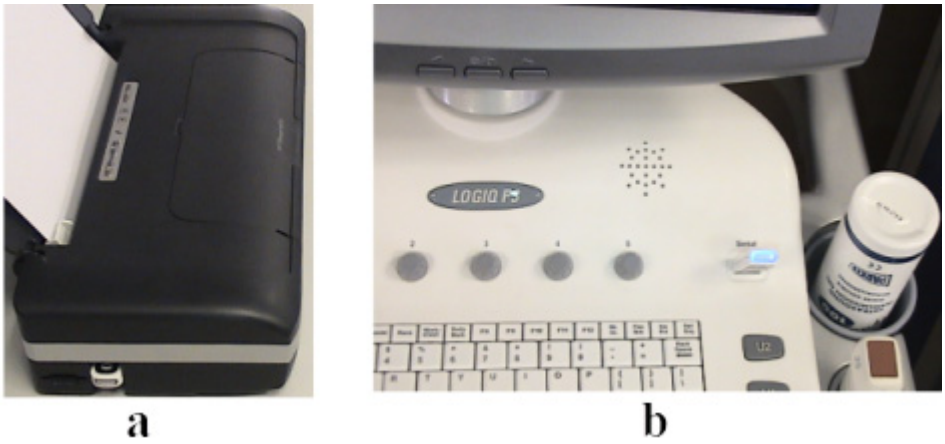


Figure 3-26 LOGIQ P3 BT10 Printer Connection

NOTE: Please refer to the User manual of each peripheral for information needed by the user to operate the system safely.

NOTE: For the printer, bluetooth supports approximately within 10 mts. line of sight.

NOTE: If the software is reloaded, you must pair between the bluetooth dongles (printer bluetooth dongle and th system dongle).

3-6-5 Configuring the Bluetooth Printer

After loading the software, follow the steps below to configure the Bluetooth Printer.

1.) Select Start on the Taskbar
2.) Select Bluetooth
3.) Select My Bluetooth
4.) Select Entire Bluetooth Neighborhood

The device will search for the Bluetooth Printer.

5.) Select HP Officejet
6.) Select pair device
7.) Enter 0000 (four zeroes), the security code
8.) Select OK

NOTE: Wait for few seconds till the check mark is seen on the printer.

9.) Select Print properties
10.) Print Test page
11.) Select Start ---> Bluetooth

Assign standard print to any of the print keys. Refer User Manual.

3-6-6 Available Probes

See in specification in the LOGIQ P3 User Reference Manual for Probes and intended use.

Table 3-11 List of Probes for LOGIQ P3

Probe Name	Area of Using	TYPE	Catalog Number	Part Number
4C	GENERAL PURPOSE	CONVEX	H4904PC	5123455
E8C	TRANSVAGINAL TRANSRECTAL	MICRO-CONVEX	H40412LE	2294641
E8CS	TRANSVAGINAL TRANSRECTAL	MICRO-CONVEX	H44801HR	47236865
8C	Abdomen, OB/GYN, Urology	MICRO-CONVEX	H40412LJ	2348094
11L	Vascular, Small Parts, Musculoskeletal, Masso sonography	LINEAR	H40412LY	5171885
8L	SMALL PARTS PERIPHERAL VASCULAR	LINEAR	H4001DB	5140738
3S	Cardiac, Transcranial	SECTOR	H4701SZ	2323337
5cs	Abdomen, OB/GYN, Urology	CONVEX	H4001DC	5143934
t739	INTRAOPERATIVE	LINEAR	H40212LM	2259246
The following probes are included for LOGIQ P3 BT10 along with the above probes:				
7.5LA	SMALL PARTS PERIPHERAL VASCULAR	LINEAR	H48282LA	5334811
6S	Cardiac, Pediatric	SECTOR	H45021RS	47236867
3.5CA	GENERAL PURPOSE	CONVEX	H48282LB	5334810

3-6-7 Software/Option Configuration

Refer to the LOGIQ P3 Basic User Manual, Chapter 16, Customizing Your System for information on configuring items like Hospital, Department, Language, Units (of measure), Date, Time and Date Format.

For information on configuring Software Options, Refer to the LOGIQ P3 Basic User Manual, Chapter 16, Customizing Your System.

For information on configuring DICOM Connectivity, Refer to the LOGIQ P3 Basic User Manual, Chapter 16, Customizing Your System.

NOTE: After enabling the Software Option, do a Full Maintenance Reboot. (LOGIQ P3)

NOTE: After enabling the Software Option, you must Shutdown and Reboot. (LOGIQ P3 BT10)

Section 3-7
Connectivity Installation Worksheet

Site System Information

Site:

Dept:

LOGIQ SN:

Type:

Floor:

Room:

REV:

Comments:

CONTACT INFORMATION

Name	Title	Phone	E-Mail Address

TCP/IP Settings

Name - AE Title:

IP Settings

IP Address:

Subnet Mask:

Default Gateway:

Remote Archive Setup

Remote Archive IP:

Remote Archive Name:

Services (Destination Devices)

	Device Type	Manufacturer	Name	IP Address	Port	AE Title
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Section 3-8
Loading Base Image Software

This information has been moved, please refer to:

Section 8-14 "Loading Base Image Software" on page 8-86

NOTE: The Base and Application DVD are single DVD.

Section 3-9Software Version check out

3-9-1 Functional Check-out

1.) Power on LOGIQ P3 scanner and wait until system booting to main screen.
2.) Press UTILITY key on control panel.
3.) Choose the About button on the right.

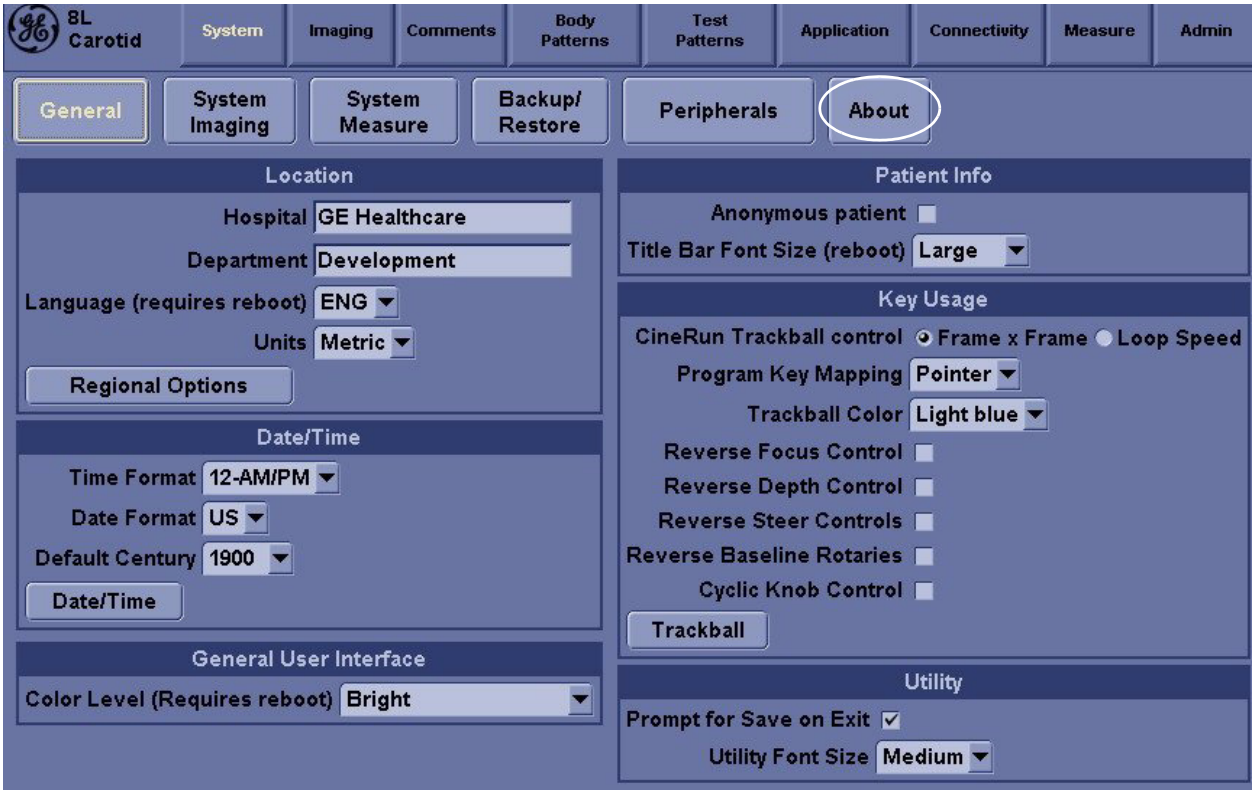


Figure 3-27 About

4.) Check whether "Software version" is the right version for use.

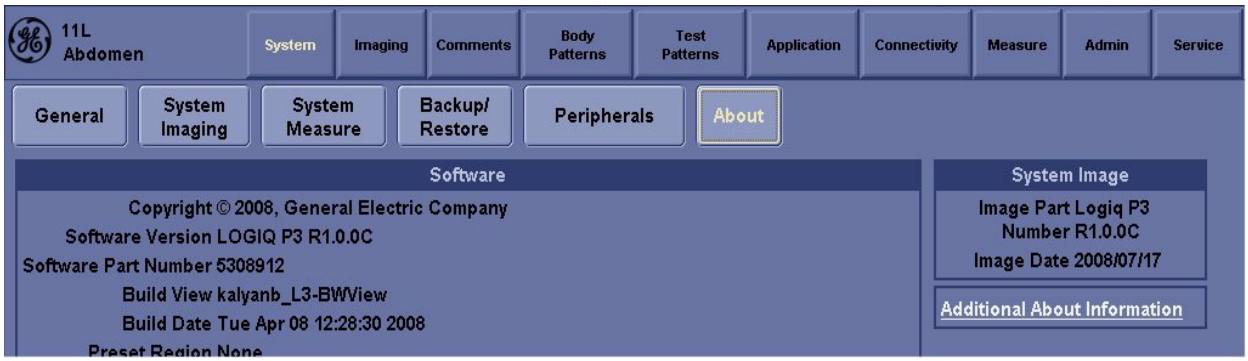


Figure 3-28 Software version

Section 3-10
Paperwork

NOTE: During and after installation, the documentation (i.e. User Manuals, Installation Manuals...) for the peripheral units must be kept as part of the original system documentation. This will ensure that all relevant safety and user information is available during the operation and service of the complete system.

3-10-1 Product Locator Installation

NOTE: The Product Locator Installation Card shown may not be same as the provided Product Locator card.

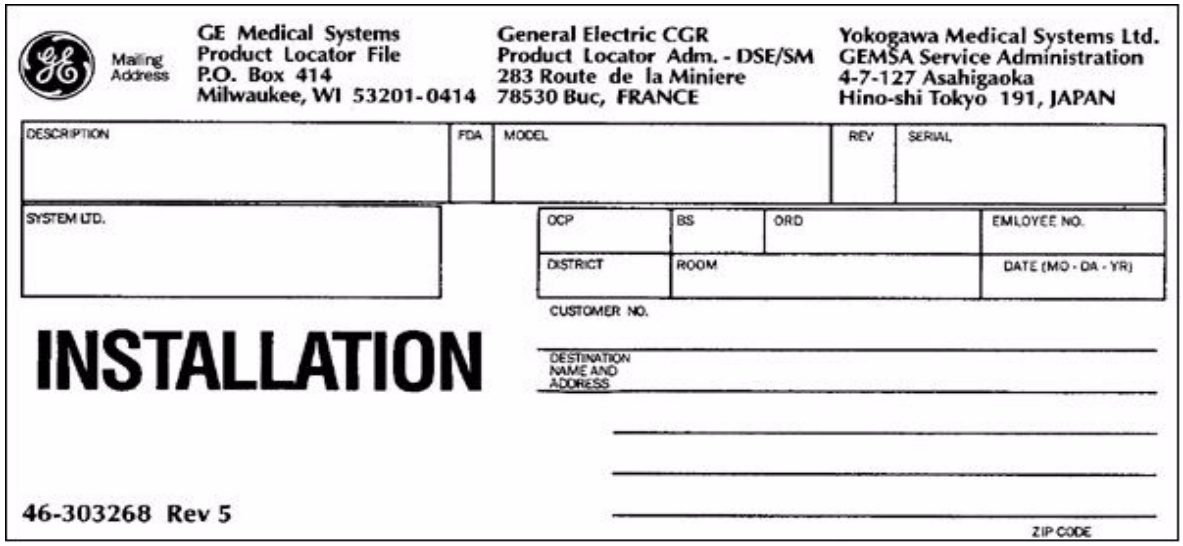


Figure 3-29 Product Locator Installation Card

3-10-2 User Manual(s)

User Check that the correct User Manual(s) for the system and software revision, is included with the installation. Specific language versions of the User Manual may also be available. Check with your GE Sales Representative for availability.

Chapter 4
Functional Checks

Section 4-1
Overview

4-1-1 Purpose for Chapter 4

This chapter provides procedures for quickly checking major functions of the LOGIQ P3 console, diagnostics by using the built-in service software, and power supply adjustments.

Section	Description	Page Number
4-1	Overview	4-1
4-2	Required Equipment	4-1
4-3	General Procedure	4-2
4-4	Software Configuration Checks	4-37
4-5	Peripheral Checks	4-37

Table 4-1 Contents in Chapter 4

Section 4-2
Required Equipment

To perform these tests, you'll need any of the sector, linear, or convex transducers.

(normally you should check all the transducers used on the system)

Section 4-3
General Procedure

CAUTION **SYSTEM REQUIRES ALL COVERS**

Operate this unit only when all board covers and frame panels are securely in place. The covers are required for safe operation, good system performance and cooling purposes.

NOTICE Lockout/Tagout Requirements (For USA only)

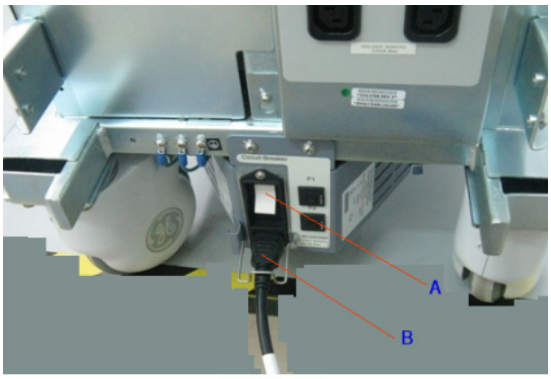
Follow OSHA Lockout/Tagout requirements by ensuring you are in total control of the Power Cable on the system.

4-3-1 Power On/Boot Up

After AC power cable is connected correctly to the transformer & Circiut breaker is switched on, the power is applied to the scanner & the system is in Stand By mode. In the Control panel ***Power On/Off*** key will be Amber color.

4-3-1-1 Boot Up

In the control Panel press the power On/Off key the led color will turn in Green color & the system will boot.



LOGIQ P3

LOGIQ P3 BT10

Figure 4-1 Connect AC adapter

LOGIQ P3	LOGIQ P3 BT10
A. Circuit Breaker	a. Circuit Breaker
B. Power Cable	b. Power Cable

4-3-1-1 Boot Up (cont'd)

When power is applied to the scanner, power is distributed to the Cooling Unit, Control Panel, LCD, Peripherals and the TMST.

4-3-1-2 Turn on the system

Press the ***Power On/Off*** switch at the front of the system once.

Figure 4-2 Power On/Off Switch

When the ***Power On/Off*** switch on the Control Panel is pressed once, the TMST starts and the software code is distributed to initiate the scanner.

No status messages are displayed during this process.

4-3-2 Power Off/ Shutdown

NOTE: After turning off a system, wait for at least twenty seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

4-3-2-1 TMST Power Down

To power down the system:

1.) Press the ***Power On/Off*** switch at the front of the system once.
2.) The System-Exit window is displayed.

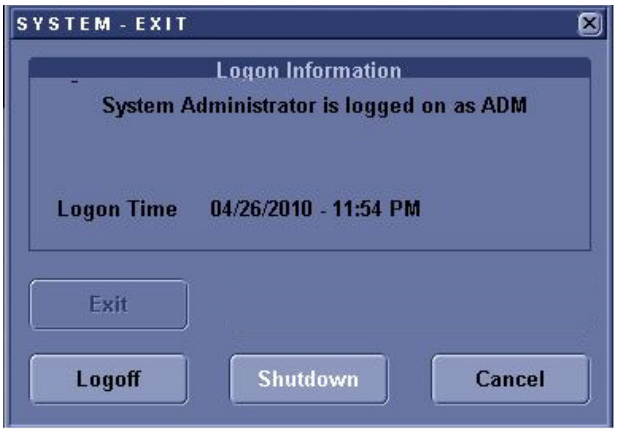


Figure 4-3 System Exit Window

3.) Using the Trackball or Select key, select Shutdown.

4-3-2-1 TMST Power Down (cont'd)

4.) The shutdown process takes 15 seconds and the power off sequence is complete when the power status LED is turned Amber.

5.) Disconnect the probes.Clean or disinfect all probes as necessary. Store them in their shipping cases to avoid damage.

4-3-2-2 Scanner Shutdown

Disconnect the Mains Power Cable is necessary. *For example:* Relocating the scanner.

⚠ **CAUTION** **DO NOT unplug and/or transport the unit until after the power off sequence has been completed. Failure to do so may result in corrupted patient files.**

4-3-2-3 Full Maintenance Reboot (LOGIQ P3)

Full Maintenance Reboot will fully restart the whole system for performance improvement.

1.) Press the ***Power On/Off*** switch at the front of the system once.

2.) Click "Shutdown".

3.) Full Maintenance Reboot dialog is displayed.

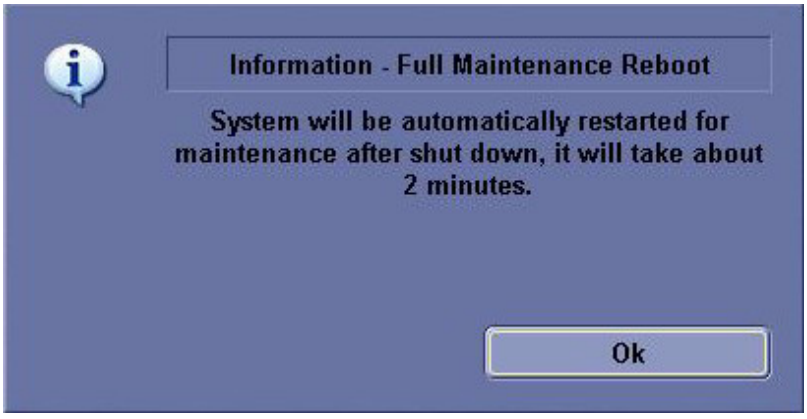

Information - Full Maintenance Reboot
System will be automatically restarted for maintenance after shut down, it will take about 2 minutes.
Ok

Figure 4-3 "Full Maintenance Reboot" dialog

4.) During Full Maintenance the pop up window will two options "Ok" and "Cancel" press cancel for Normal shutdown (Hibernate) and Ok for Shutdown.

4-3-3 Archiving and Loading Presets

NOTE: Always save presets before any software reload. This ensures the presets loaded after the software reload are as up–to–date as possible.

All user presets except changes to Summary, Anatomy, and Biometry pages, can be saved on an DVD-R disk (or USB memory device) for reloading on the system.

NOTICE Presets should NOT be saved on the same DVD-R disk (or USB memory device) as images. The Archive Menu lists the images but does NOT list the presets stored on a DVD-R disk (or USB memory device).

4-3-3-1 Archiving Presets to a DVD-R Disk (or USB memory device)

1.) Insert an empty (blank) DVD-R disk into the DVD Drive.
2.) Access to the Utility Menu, and select System. The Backup sheet will be shown on the LCD display.

Figure 4-4 Backup Sheet

3.) Select the item to back up either from Resource Files.
4.) Enter backup destination or browse through the disk to locate the destination.
5.) Select Backup now. The backup status for each item is displayed on the Result column.

4-3-3-2 Loading Presets from a DVD-R disk (or USB memory device)

1.) Insert the DVD-R disk with the archived Presets into the DVD Drive.
2.) Access to the Utility Menu, and select System. The Restore sheet will be shown on the LCD display. (see Figure 4-4)
3.) Select the item to restore either from Resource Files.
4.) Enter restore destination or browse through the disk to locate the destination.
5.) Select Restore. The restore status for each item is displayed on the Result column.

4-3-4 Adjusting the Display Monitor

Please refer to Section 6-2 "Monitor Adjustments" on page 6-2.

4-3-5 System Features

4-3-5-1 Control Panel

Figure 4-5 Control Panel Tour

1.) TGC
2.) New Patient
3.) App selection/Preset Key
4.) Report & End Exam
5.) Imaging/Coments/Clear/Measurement Keys
6.) Mode/Gain/Auto Keys/Zoom/Ellipse
7.) Depth
8.) Left/Right/ATO/THI
9.) Freeze
10.) Reverse
11.) Print Keys
12.) User Defined Keys
13.) A/N Keyboard
14.) Sub Menu Keys
15.) NTUPI/Top Menu Keys

4-3-5-2 LOGIQ P3 SoftMenu Key Tour

In general, there are two types of NTPUI/SoftMenu keys: Paddle Switch and adjustable knobs.

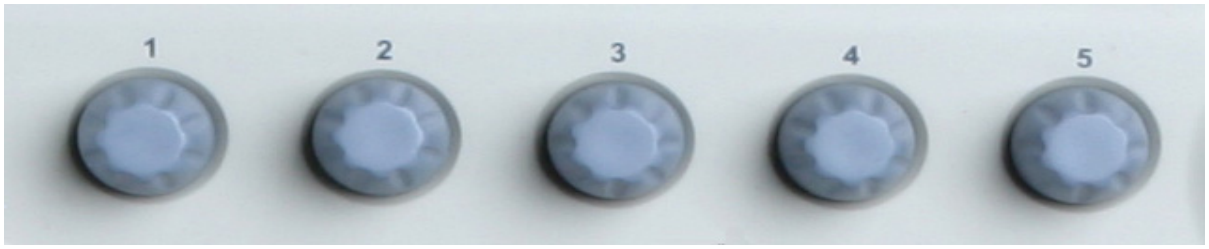


Figure 4-6 SoftMenu Key Tour

1.) The Paddle Switch is used to access and adjust the Sub SoftMenu.
2.) Press the adjustable knobs to toggle option menu between line one and line two.
3.) Rotate the adjustable knobs to adjust the corresponding parameters.

4-3-5-3 Monitor Display

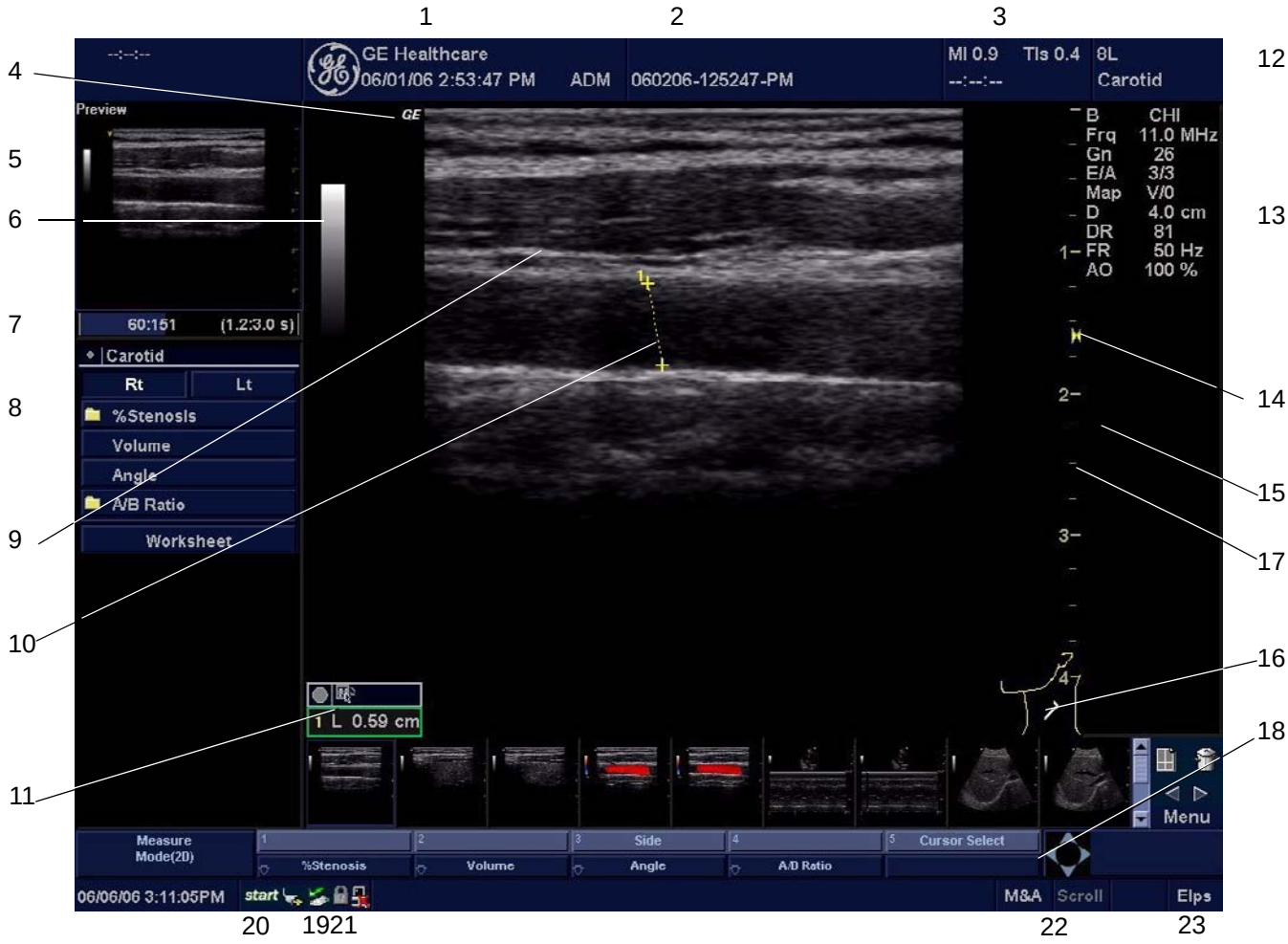


Figure 4-7 Monitor Display Tour

Monitor Display Features

1. Institution/Hospital Name, Date, Time, Operator Identification, system status (real-time of frozen).	13. Imaging Parameters by Mode (current mode highlighted).
2. Patient Name, Patient Identification.	14. Focal Zone.
3. Acoustic Output Readout,	15. TGC (not shown on the image).
4. GE Symbol: Probe Orientation Marker. Coincides with a probe orientation marking on the probe.	16. Body Pattern.
5. Image Preview.	17. Depth Scale.
6. Gray/Color Bar.	18. SoftMenu
7. Cine Gauge.	19. Caps Lock: On/Off.
8. Measurement Summary Window.	20. Start menu icon.
9. Image.	21. Network icon
10. Measurement.	22. Trackball Functionality Status: Scroll, M&A (Measurement and Analysis), Position, Size, Scan Area Width and Tilt.
11. Results Window.	23. Active key for Depth/Zoom/Ellipse
12. Probe Identifier. Exam Study.	

4-3-6 B Mode Checks

4-3-6-1 Preparations

1.) Connect one of the probes listed in 3-6-6 "Available Probes" on page 3-26, in Chapter 3 Installation to the System probe connector.

2.) Turn ON the scanner (if it isn't turned on already)

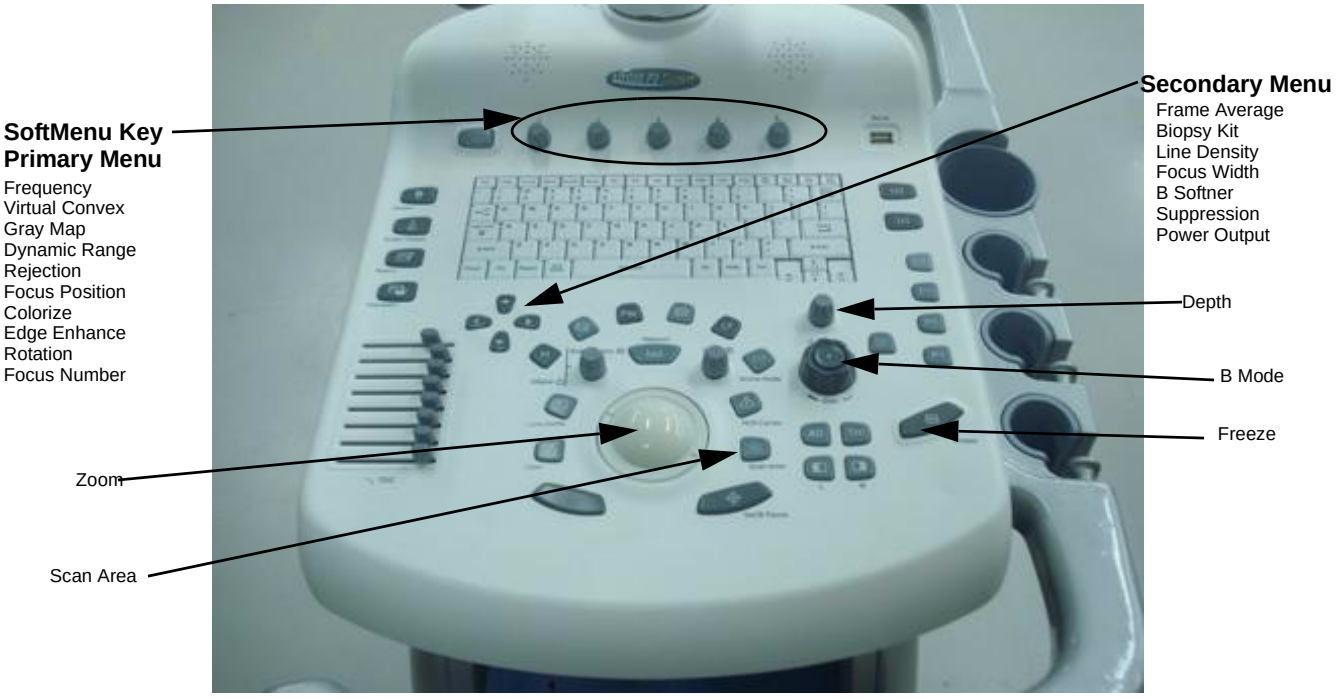


Figure 4-8 Controls available in B Mode

Figure 4-9 B Mode Screen Picture Example

4-3-6-2 B Mode OP Panel Controls

Table 4-2 B Mode Control Panel Controls

Step	Task	Expected Result(s)
1	Press B Mode key	B Mode Starts
2	Adjust Depth	Adjust the field of view. Increasing the depth may view larger/deeper structures rates, and decreasing the depth may view near the skin line.Press Up/Down Button to increase/ decrease. Depth displays on the monitor in cm.
3	Adjust Gain	Controls the amount of echo information displayed in an image. Turn B Mode dial to the left/right to increase/decrease Gain. Gain displays on the monitor in G (dB).
4	Adjust Focus	Increases the number of focal zones or moves the focal zone(s) to tighten up the beam for specific area. Press the control to toggle between Focus Position and Focus Number. Press Up/Down Button to move or adjust the focal numbers.
5	Activate Auto Optimize	Optimize the image based upon a specified region of interest or anatomy. Press the Center Button in the Gain Dial to toggle the ATO/ACE On and Off.
7	Adjust Time Gain Compensation (TGC)	Amplifies the returning signals to correct for the attenuation caused by tissues at increasing depth. TGC slide pots spaced proportional to the depth. Move the slide pots to the left/right to decrease/increase TGC. A TGC curve appears on the display.
8	Adjust Scan Area	Widen or narrow the size of the sector angle to maximize the image's region of interest (ROI). Press Scan Area and move the Trackball to narrow/widen the angle.
9	Adjust Zoom	Changes the location of the focal point(s). A triangular focus marker indicates the depth of the focal point.
10	Reverse	Toggles the left/right orientation of the scan image.

4-3-6-3 B Mode Softmenu Key

Table 4-3 B Mode Softmenu Key

Step	Task	Expected Result(s)
1	Adjust Rejection	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).
2	Activate Colorize	Enables gray scale image colorization. To deactivate, reselect a Gray Map.
3	Adjust Edge Enhance	Edge Enhance brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures. Adjustments to M Mode's edge enhancement affects the M Mode only.
4	Activate Gray Map	Determines how the echo intensity levels received are presented as shades of gray.
5	Adjust Frequency	Multi Frequency mode lets you downshift to the probe's next lower frequency or shift up to a higher frequency.
6	Adjust Frame Average	Temporal filter that averages frames together. This has the effect of presenting a smoother, softer image.
7	Adjust Rotation	Rotates the image by selecting the value from the pop-up menu.
9	Adjust Line Density	Optimizes B Mode frame rate or spatial resolution for the best possible image.
10	Power output	Optimizes image quality and allows user to reduce beam intensity. 2% increments between 0-100%. Values greater than 0.1 are displayed.
11	Dynamic Range	Dynamic Range controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast.
12	Focus Number and Position	Increases the number of transmit focal zones or moves the focal zone(s) so that you can tighten up the beam for a specific area. A graphic caret corresponding to the focal zone position(s) appears on the right edge of the image.
13	Virtual Convex	Virtual Convex for linear probe

4-3-7 M Mode Controls

4-3-7-1 Preparations

1.) Connect one of the probes listed in 3-6-6 "Available Probes" on page 3-26, in Chapter 3 Installation to the System probe connector.

2.) Turn ON the scanner (if it isn't turned on already).

Figure 4-10 Controls available in M Mode

Figure 4-11 M Mode Screen Picture Example

4-3-7-2 M Mode OP Panel Controls

Table 4-4 M Mode OP Panel Controls

Step	Task	Expected Result(s)
1	Press M Mode key	M Mode Starts
2	Adjust Gain	Controls the amount of echo information displayed in an image. Turn B Mode dial to the left/right to increase/decrease Gain. Gain displays on the monitor in G (dB).
3	Display M-Mode Cursor	Displays the M-Mode cursor on the B-Mode image. Press Cursor and Trackball to position M-Mode Cursor.

4-3-7-3 M Mode Softmenu Key

Table 4-5 M Mode Softmenu Key

Step	Task	Expected Result(s)
1	Adjust Rejection	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).
2	Adjust Sweep Speed	Changes the speed at which the time line is swept. The following speed values are available, 1, 2, 3, 4, 6, 8, 12, 16.
3	Adjust Edge Enhance	Edge Enhance brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures. Adjustments to M Mode's edge enhancement affects the M Mode only.
4	Activate Gray Map	Determines how the echo intensity levels received are presented as shades of gray.
6	Activate Colorize	Enables gray scale image colorization. To deactivate, reselect a Gray Map.
7	Activate Full Timeline	Displays only timeline screen. Press the Full Timescreen to activate.
8	Select Display Format	Select the format to display B image and M image on the LCD. Press Display Format, and select from the pop up menu.
9	Adjust Dynamic Range	Dynamic Range controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast.
10	Power output	Optimizes image quality and allows user to reduce beam intensity. 2% increments between 0-100%. Values greater than 0.1 are displayed.

4-3-8 Color Flow Mode Checks

4-3-8-1 Preparations

1.) Connect one of the probes listed in 3-6-6 "Available Probes" on page 3-26, in Chapter 3 Installation to the System probe connector.

2.) Turn ON the scanner (if it isn't turned on already).

Figure 4-12 Controls available in Color Flow Mode

Figure 4-13 CFM Mode Screen Picture Example

4-3-8-2 Color Flow Mode OP Panel Controls

Table 4-5 Color Flow Mode OP Panel Controls

Step	Task	Expected Result(s)
1	Press CFM-Mode key	CFM Mode Starts
2	Adjust Gain	Amplifies the overall strength of the echoes processed in the Color Flow window. Turn the Gain dial (CFM Mode key) to the left/right to increase/decrease Gain.

4-3-8-3 Color Flow Mode Softemenu Key

Table 4-6 Color Flow Mode Softmenu Key

Step	Task	Expected Result(s)
1	Threshold	Threshold assigns the gray scale level at which color information stops.
2	Packet Size	Controls the number of samples gathered for a single color flow vector.
3	Select Color maps	Allows a specific color map to be selected. After a selection has been made, the color bar displays the resultant map.
4	Adjust Frequency	Enables the adjustment of the probe's operating frequency. Press Frequency and select desired value. The selected frequency is displayed in the status window.
5	Set Frame Average	Averages color frames. Press Frame Average up/down to smooth temporal averaging.
6	Color Invert	Views blood flow from a different perspective. Press Invert to reverse the color map.
7	Adjust LIne Density	Trades frame rate for sensitivity and spatial resolution. If the frame rate is too slow, reduce the size of the region of interest, select a different line density setting, or reduce the packet size.
8	Activate Spatial Filter	
9	Adjust Dynamic Range	Dynamic Range controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast.
10	Activate ACE	Eliminates the motion artifacts. Press Ace to activate.
11	Adjust Angle Steer	Slants the Color Flow region of interest or the Doppler line to obtain a better Doppler angle.
12	Move Baseline	Adjusts the baseline to accommodate faster or slower blood flows to eliminate aliasing.
13	Change PRF (Pulse Repetition Frequency)	Velocity scale determines pulse repetition frequency. If the sample volume gate range exceeds single gate PRF capability, the system automatically switches to high PRF mode. Multiple gates appear, and HPRF is indicated on the display.
14	Transparency Map	Allows to select specific transparency map
15	Focus Position	Increases the number of transmit focal zones or moves the focal zone(s) so that you can tighten up the beam for a specific area. A graphic caret corresponding to the focal zone position(s) appears on the right edge of the image.
16	Capture (Not available for LOGIQ P3 BT10)	

Table 4-6 Color Flow Mode Softmenu Key

Step	Task	Expected Result(s)
17	Power output	Optimizes image quality and allows user to reduce beam intensity. 10% increments between 0-100%. Values greater than 0.1 are displayed.
18	Wall Filter	Wall Filter insulates the Doppler signal from excessive noise caused from vessel movement.

4-3-9 Doppler Mode Checks

4-3-9-1 Preparations

1.) Connect one of the probes listed in 3-6-6 "Available Probes" on page 3-26, in Chapter 3 Installation to the System probe connector.

2.) Turn ON the scanner (if it isn't turned on already).

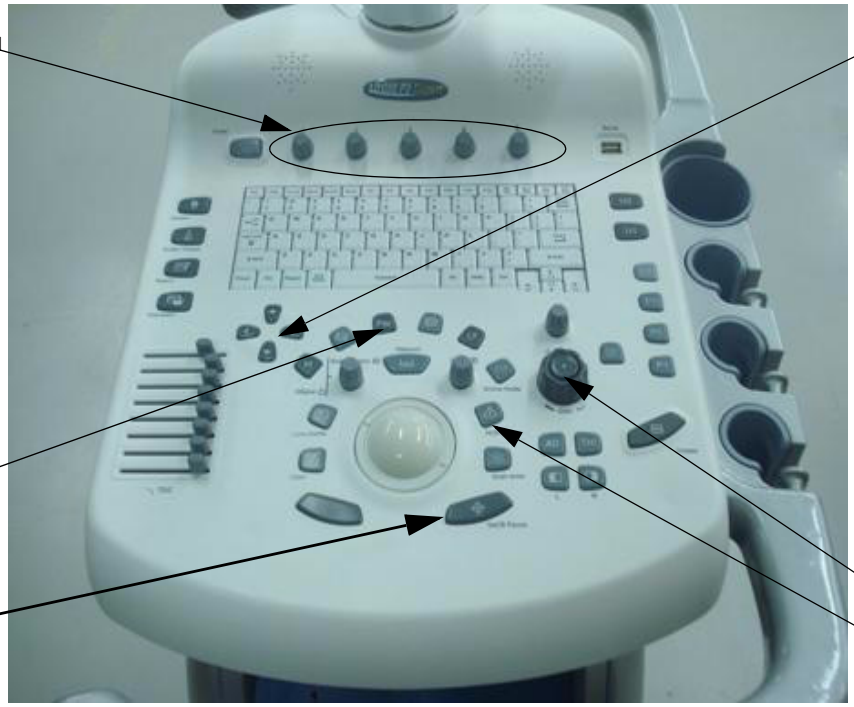


Figure 4-14 Controls available in Doppler Mode

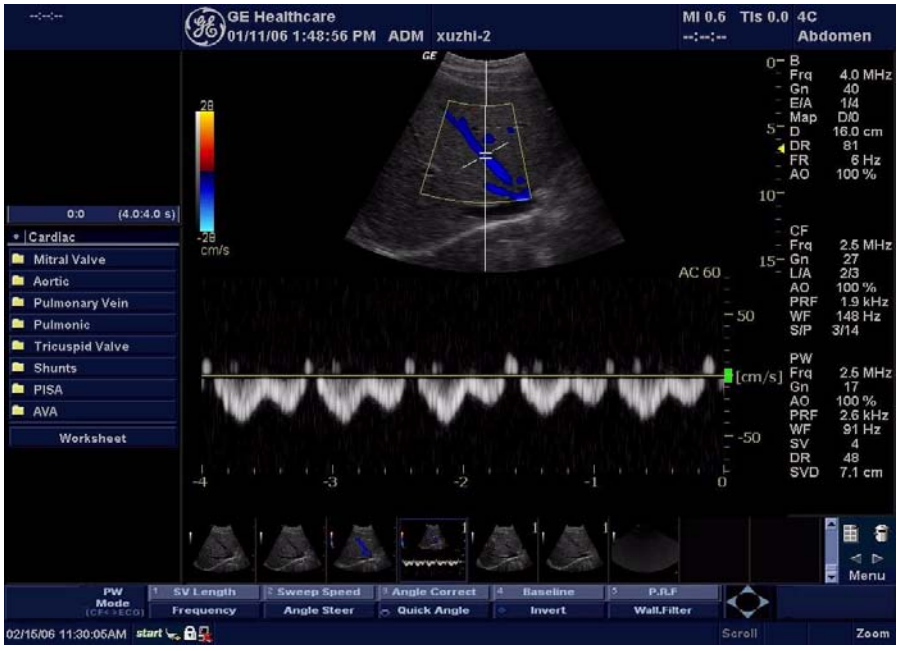


Figure 4-15 Doppler Mode Screen Picture Example

4-3-9-2 Doppler Mode OP Panel Controls

Table 4-7 Doppler Mode OP Panel Controls

Step	Task	Expected Result(s)
1	Press PW Mode key	PW Mode Starts
2	Adjust Gain	Amplifies the overall strength of the echoes processed in the Color Flow window. Turn the Gain dial (PW Mode key) to the left/right to increase/decrease Gain.
3	Display M/D-Mode Cursor	Displays the M/D-Mode cursor on the B-Mode image. Press Cursor and Trackball to position sample volume graphic. Click SV gate to adjust sample volume gate size.
4	B-Pause	Toggle between simultaneous and update presentation while viewing Spectral Doppler. Press B Pause to toggle between simultaneous and update.

4-3-9-3 Doppler Mode OP Panel Controls

Table 4-8 Doppler Mode Touch Panel Controls

Step	Task	Expected Result(s)
1	Adjust Rejection	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).
2	Adjust Sweep Speed	Changes the speed at which timeline is swept. Press Sweep Speed up/down to increase/decrease the value.
3	Activate Full Timeline	Displays only timeline screen. Press the Full Timescreen to activate.
4	Select Display Format	Display layout can be preset to have B-Mode and Time-motion side-by-side or over-under.
5	Adjust Frequency	Enables the adjustment of the probe's operating frequency. Press Frequency and select desired value. The selected frequency is displayed in the status window.
6	Trace Direction	Allows to select different trace direction.
7	Invert	Vertically inverts the spectral trace without affecting the baseline position. Press invert to invert the spectral trace. The Plus and Minus signs on the velocity scale reverse when the spectrum is inverted.
8	Auto Calculation	Enables or disables auto calculation.
9	Modify Calcs	Activates the window to modify the auto calculation items.
10	Trace Method	Allows to select different trace method.
11	Activate Colorize	Colorize the gray scale image to enhance the eyes' discrimination capability. Press the Cololize, Trackball to cycle through available maps and press Set to select.
12	Activate Gray Map	Displays a map window adjacent to the image. Move the trackball to select the map. The image reflects the map as scrolled through the selections. Press Set to select.
13	Dynamic Range	Controls how echo intensities are converted to shades of gray. Click Dynamic Range to increase/decrease the value.
14	Adjust Angle Correct	Estimates the flow velocity in a direction at an angle to the Doppler vector by computing the angle between the Doppler vector and the flow to be measured.
15	Adjust Angle Steer	Slant the Color Flow linear image left or right to get more information without moving probes. Click Angle Steer to the left to slant the linear image.
16	Move Baseline	Adjusts the baseline to accommodate faster or slower blood flows to eliminate aliasing.

Table 4-8 Doppler Mode Touch Panel Controls

Step	Task	Expected Result(s)
17	Change PRF (Pulse Repetition Frequencies) - (Wall Filter)	Velocity scale determines pulse repetition frequency. If the sample volume gate range exceeds single gate PRF capability, the system automatically switches to high PRF mode. Multiple gates appear, and HPRF is indicated on the display.
18	Trace Sensitivity	Adjusts the sensitivity to get more accurate envelope trace.
19	Time Resolution	Adjusts the resolution in frequency domain.
20	Spectral Average	Optimizes the smoothness of the spectrum. Different levels can be selected.
21	Power output	Optimizes image quality and allows user to reduce beam intensity. 10% increments between 0-100%. Values greater than 0.1 are displayed.
22	SV Length	Sizes the sample volume gate.
23	Wall Filter	Wall Filter insulates the Doppler signal from excessive noise caused from vessel movement.

4-3-10 Basic Measurements

*NOTE: The following instructions assume that you first scan the patient and then press **Freeze**.*

4-3-10-1 Distance and Tissue Depth Measurements

1.) Press **MEASURE** once; an active caliper displays.
2.) To position the active caliper at the start point (distance) or the most anterior point (tissue depth), move the **TRACKBALL**.
3.) To fix the start point, press ***Set***. The system fixes the first caliper and displays a second active caliper.
4.) To position the second active caliper at the end point (distance) or the most posterior point (tissue depth), move the **TRACKBALL**.
5.) To complete the measurement, press **SET**. The system displays the distance or tissue depth value in the measurement results window.

Before you complete a measurement:

To toggle between active calipers, press **MEASURE**.

To erase the second caliper and the current data measured and start the measurement again, press **CLEAR** once.

*NOTE: To rotate through and activate previously fixed calipers, adjust **CURSOR SELECT**.*

*NOTE: After you complete the measurement, to erase all data that has been measured to this point, but not data entered onto worksheets, press **CLEAR**.*

4-3-10-2 Circumference/Area (Ellipse) Measurement

1.) Press **MEASURE** once; an active caliper displays.
2.) To position the active caliper, move the **TRACKBALL**.
3.) To fix the start point, press **SET**. The system fixes the first caliper and displays a second active caliper.
4.) To position the second caliper, move the **TRACKBALL**.
5.) Adjust the **ELLIPSE**; an ellipse with an initial circle shape appears.
6.) To position the ellipse and to size the measured axes (move the calipers), move the **TRACKBALL**.
7.) To increase the size, rotate the **ELLIPSE** button clockwise. To decrease the size, contrarotate the **ELLIPSE** button.
8.) To toggle between active calipers, press **MEASURE**.
9.) To complete the measurement, press **SET**. The system displays the circumference and area in the measurement results window.

Before you complete a measurement:

- To erase the ellipse and the current data measured, press **CLEAR** once. The original caliper is displayed to restart the measurement.
- To exit the measurement function without completing the measurement, press **CLEAR** a second time.

4-3-10-3 Worksheets

Measurement/Calculation worksheets are available to display and edit measurements and calculations. There are generic worksheets as well as Application specific worksheets. The worksheets are selected from the Measurement Touch Panel.

4-3-11 Probe/Connectors Usage

4-3-11-1 Connecting a probe

1.) Place the probe's carrying case on a stable surface and open the case.
2.) Carefully remove the probe and unwrap the probe cable.
3.) DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage.
4.) Align the connector with the probe port and carefully push into place.
5.) Lock the probe latch upward.
6.) Carefully position the probe cord so it is free to move and is not resting on the floor.

4-3-11-2 Activating the probe

The probe activates in the currently-selected operating mode. The probe's default settings for the mode and selected exam are used automatically.

4-3-11-3 Deactivating the probe

When deactivating the probe, the probe is automatically placed in standby mode.

1.) Press the ***Freeze*** key.
2.) Gently wipe the excess gel from the face of the probe. (Refer to the Basic User Manual for complete probe cleaning instructions.)
3.) Carefully slide the probe into the Front Probe Port and rotate the probe lock clock wise . Ensure that the probe is placed gently in the probe holder.

4-3-11-4 Disconnecting the probe

Probes can be disconnected at any time. However, the probe should not be selected as the active probe.

1.) Rotate the probe lock antclock wise.
2.) Pull the probe straight out of the probe port.
3.) Carefully slide the probe and away from the probe port.
4.) Ensure the cable is free.
5.) Be sure that the probe head is clean before placing the probe in its storage box.

4-3-12 Using Cine

4-3-12-1 Activating CINE

Press **Freeze**, then roll the **Trackball** to activate CINE. To start CINE Loop playback, press Run/Stop. To stop CINE Loop playback. press Run/Stop.

4-3-12-2 Quickly Move to Start/End Frame

Press ***First*** to move to the first CINE frame; press ***Last*** to move to the last CINE frame.

4-3-12-3 Start Frame/End Frame

Press the ***Start Frame*** Two-Button Softkey to move to the beginning of the CINE Loop. Adjust the ***Start Frame*** up/down Two-Button Softkey upward to move forward through the CINE Loop. Adjust the Softkey downward to move backward through the CINE Loop.

Press the ***End Frame*** Two-Button Softkey to move to the end of the CINE Loop. Adjust the ***End Frame*** up/down Two-Button Softkey upward to move forward through the CINE Loop. Adjust the Softkey downward to move backward through the CINE Loop.

4-3-12-4 Adjusting the CINE Loop Playback Speed

Adjust the ***Loop Speed*** up/down Two-Button Softkey to increase/decrease the CINE Loop playback speed.

4-3-12-5 Moving through a CINE Loop Frame By Frame

Adjust the ***Frame by Frame*** up/down Two-Button Softkey to move through CINE memory one frame at a time.

4-3-13 Image Management (QG)

For Image Management functionality refer to the LOGIQ P3 Quick Guide. It talks about several topics:

- Clipboard
- Printing Images
- Browsing and Managing an Exam's Stored Image
- Connectivity, and Dataflow Concept and Creation
- Starting an Exam
- Configuring Connectivity
- TCP/IP
- Services (Destinations)
- Buttons
- Views
- Verifying and Pinging a Device

4-3-14 Backup and Restore Database, Preset Configurations and Images

NOTE: Please scan the devices (USB, Pen Drive, HDD etc..) for virus before using it with the system.

4-3-14-1 Formatting Media

1.) To format the backup media, DVD-drive, select the **UTILITY** button on the Keyboard.
2.) Select **CONNECTIVITY**, then **REMOVABLE MEDIA**. Properly label and Insert the backup media.
3.) Select the media type from the drop down menu.
4.) Enter the label for the media as shown in . It is best to use all capital letters with no spaces or punctuation marks. Press **Format**.

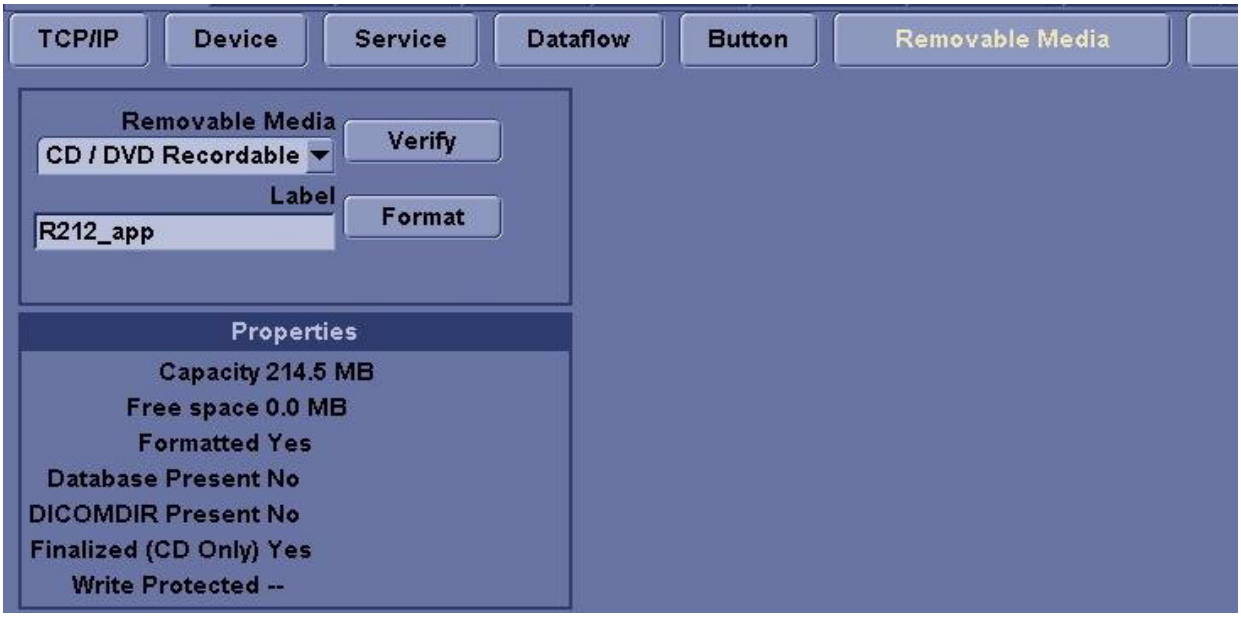


Figure 4-16 Format and Verify Media

5.) The Ultrasound system displays a pop-up menu, as shown in . When the formatting has been completed, press **OK** to continue.
6.) If desired, verify that the format was successful by returning to Utility->Connectivity->Tools and selecting **VERIFY** as shown in .

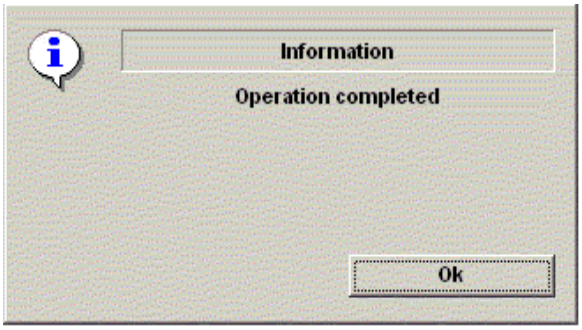


Figure 4-17 Format Successful Pop-up Menu

4-3-14-2 Backup System Presets and Configurations

NOTE: Always backup any preset configurations before a software reload. This ensures that if the presets need to be reloaded, after the software update, they will be the same ones the customer was using prior to service.

1.) Insert a formatted DVD-R into the drive.
2.) On the Keyboard, press **UTILITY**.
3.) On the LCD display, press **SYSTEM**.
4.) On the LCD display, select **BACKUP/RESTORE**.

NOTE: If you are not logged in as GE Service or with administrator privileges, the Operator Login window is displayed. Log on with administrator privileges.

5.) In the Backup list, select Patient Archive, Report Archive and User Defined Configuration.
6.) In the Media field, select DVD Drive(or USB memory device).
7.) Select **BACKUP**.

The system performs the backup. As it proceeds, status information is displayed on the Backup/Restore screen.

Check here to backup presets and configurations

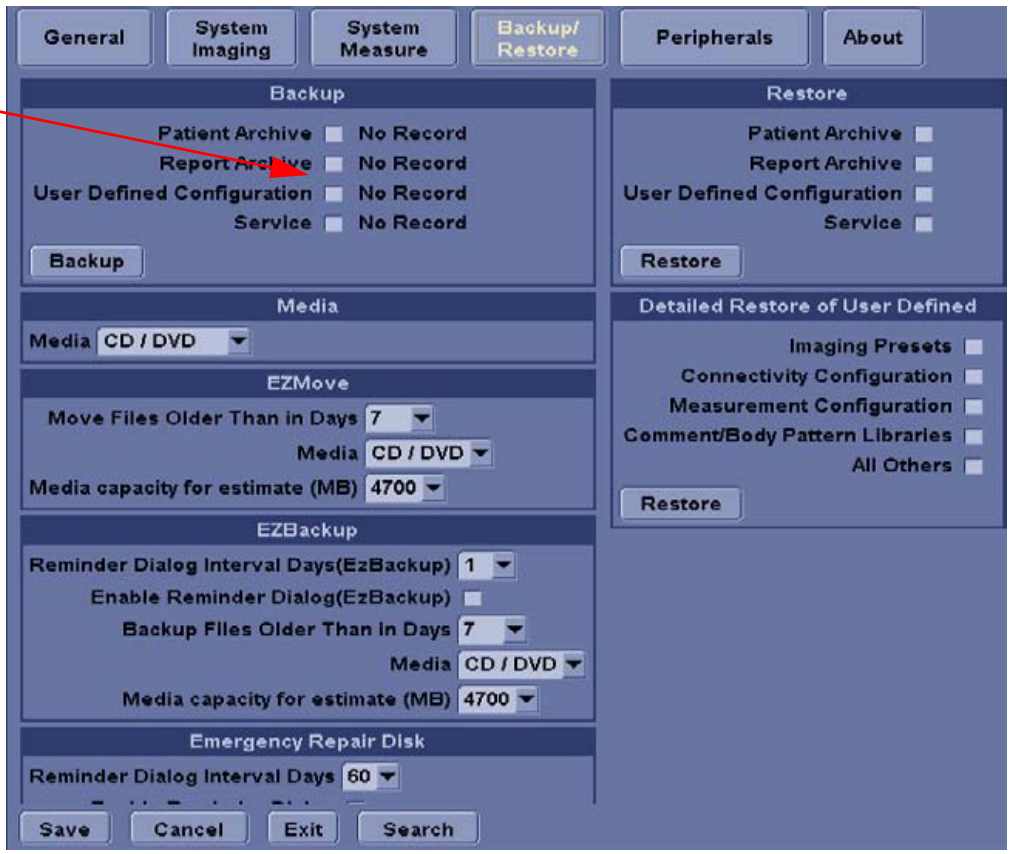


Figure 4-18 Backup/Restore Menu

4-3-14-3 Restore System Presets and Configurations

CAUTION The restore procedure **overwrites** the existing database on the local hard drive. Make sure to insert the correct DVD (or USB memory device).

1.) Insert the Backup/Restore DVD (or USB memory device) into the drive.
2.) On the Keyboard, press **UTILITY**.
3.) On the LCD display, press **SYSTEM**.
4.) On the LCD display, select **BACKUP/RESTORE**.

NOTE: If you are not logged in with administrator privileges, the Operator Login window is displayed. Log on with administrator privileges.

5.) In the Restore list, select Patient Archive, Report Archive and User Defined Configuration.
6.) In the Media field, select the Backup/Restore DVD (or USB memory device).
7.) Select **RESTORE**.

The system performs the restore. As it proceeds, status information is displayed on the Backup/Restore screen.

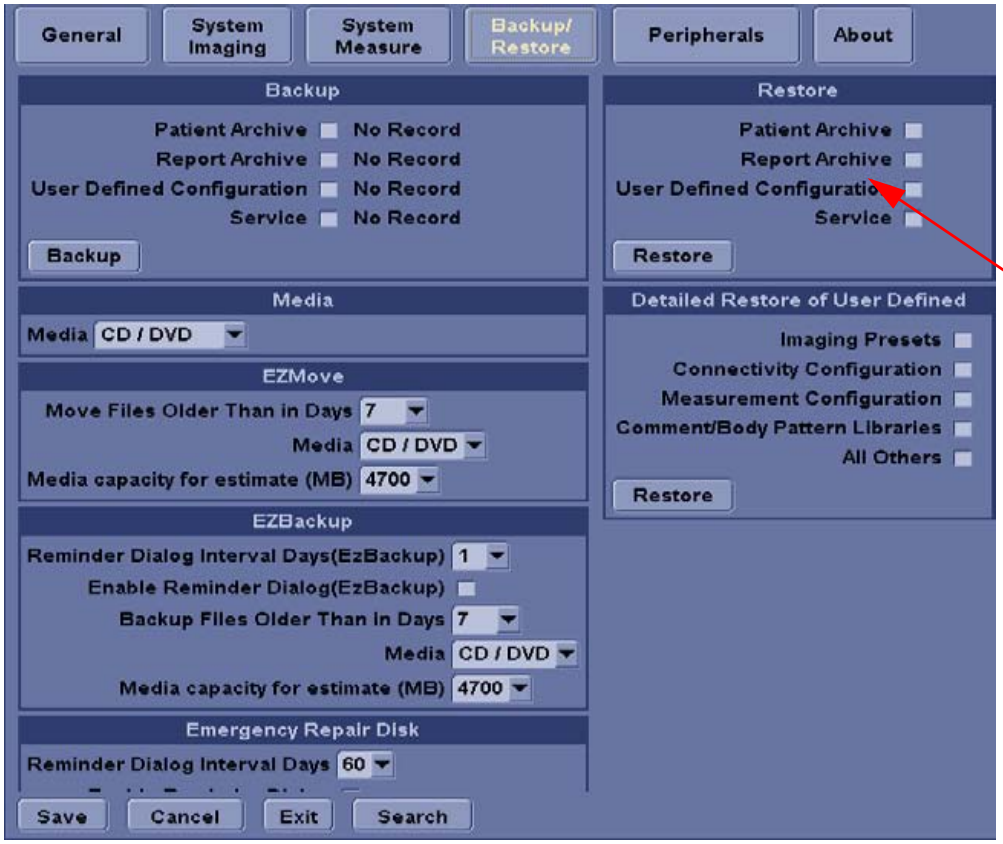


Figure 4-19 Backup/Restore Menu

4-3-14-4 Archiving Images

1.) Insert the archive media. To format the archive media, DVD-R, select the Utility button on the Keyboard.

2.) Select Connectivity, then Tools.

3.) Format the DVD-R. Verify the format if desired.

4.) Images will be moved from the hard drive by date. Therefore, the best way is to label media by date.

NOTE: Images will be moved from the hard drive by date. Therefore, the best way to label media is by date. When images are moved to the archive media, they will be deleted from the system hard drive. However, the patient database (backed up earlier) maintains pointers to the location of the images on the archive media.

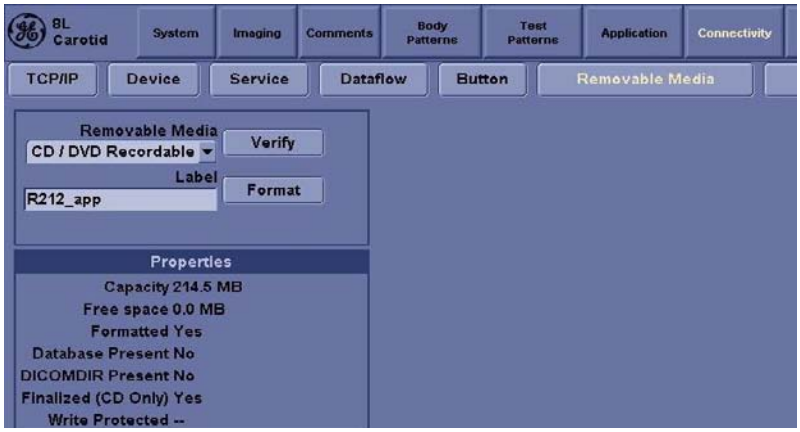


Figure 4-20 Format DVD-RW Screen

5.) Select Backup/Restore, then EZBackup/Move.

6.) Select “Backup File Older Than in Days”.

Select the days/exam to be backed up

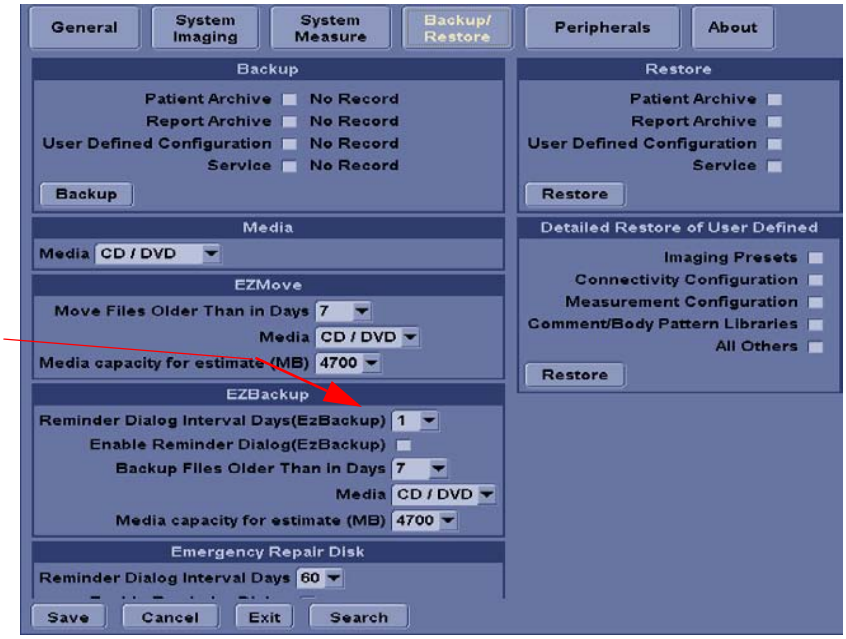


Figure 4-21 EZBackup/Move

4-3-14-4 Archiving Images (cont'd)

7.) Press **PATIENT** and set the Dataflow to store images directly to DVD-R.

8.) From the image screen, press **EZBACKUP/MOVE**. The Move Images pop-up appears.

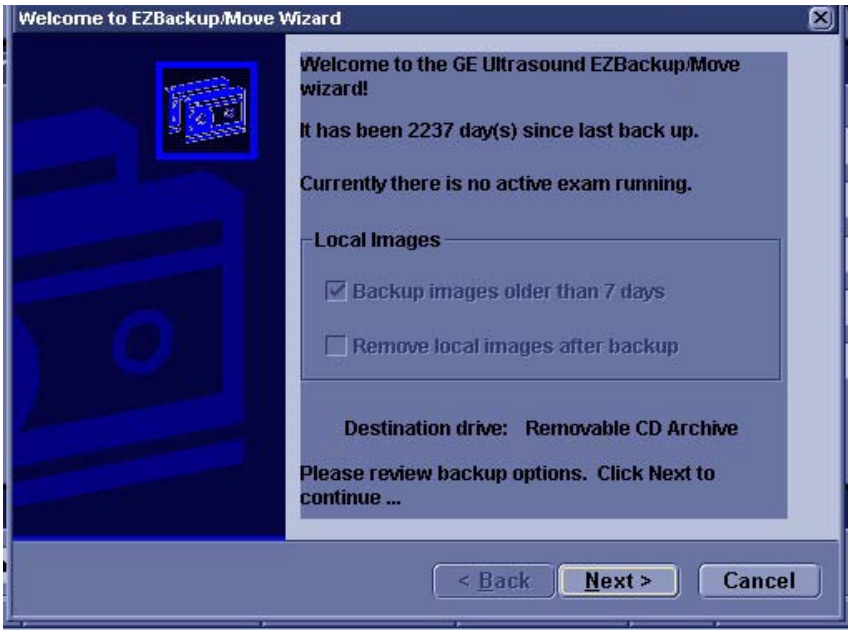

Welcome to EZBackup/Move Wizard
Welcome to the GE Ultrasound EZBackup/Move wizard!
It has been 2237 day(s) since last back up.
Currently there is no active exam running.
Local Images
Backup images older than 7 days
Remove local images after backup
Destination drive: Removable CD Archive
Please review backup options. Click Next to continue ...
< Back
Next >
Cancel

Figure 4-22 Image Archive Move Pop-up Menu

9.) Press **Next** on pop-up message.

10.) A media check message appears. Press **OK** to continue.

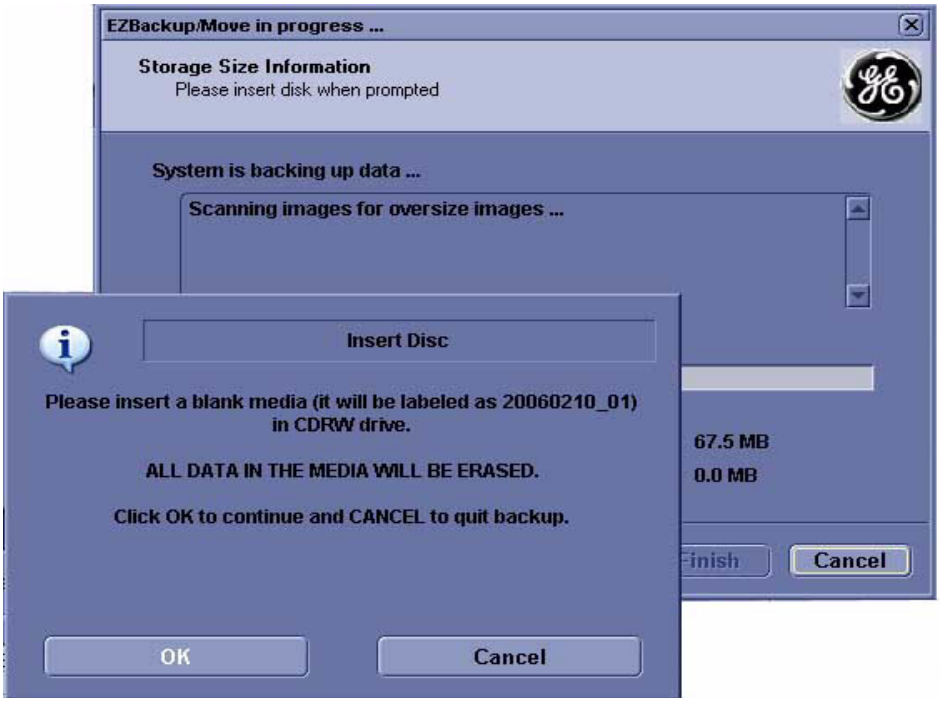

EZBackup/Move in progress ...
Storage Size Information
Please insert disk when prompted
System is backing up data ...
Scanning images for oversize images ...
67.5 MB
0.0 MB
Finish
Cancel
Insert Disc
Please insert a blank media (it will be labeled as 20060210_01) in CDRW drive.
ALL DATA IN THE MEDIA WILL BE ERASED.
Click OK to continue and CANCEL to quit backup.
OK
Cancel

Figure 4-23 Media check message

4-3-14-4 Archiving Images (cont'd)

11.) Press **Finish** after Backup/Move complete.

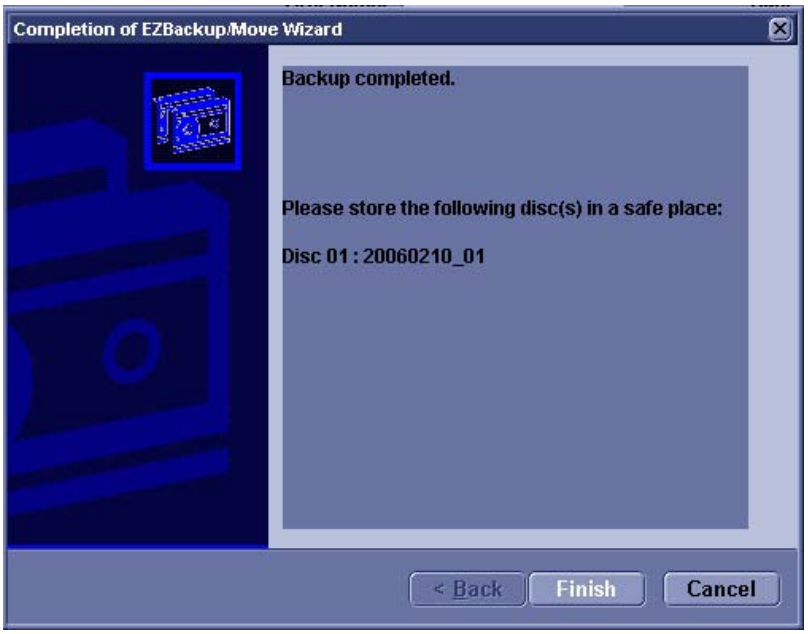


Figure 4-24 EZBackup/Move complete

All databases, presets and images should now be saved to removable media.

4-3-14-5 Full Backup

1.) Connect the USB HDD to system.

2.) Select Backup/Restore, then Emergency Repair Disk.

3.) Select "Reminder Dialog Interval Days".

Figure 4-25 Emergency Repair Disk

4-3-14-5 Full Backup (cont'd)

4.) Return to scan mode. Press Ctrl + B, the Emergency Disk Making window pop-up appears.

Welcome to Emergency Disk Making Wizard
Welcome to Emergency Disk Making Wizard!
NOTE: All data in the USB Emergency Disk will lost!!!
The Emergency Disk Making Wizard will help you create a copy of the information on your system hard disk.In the event that the original data on your hard disk is accidentally erased or overwritten, you can use the emergency disk to restore your lost or damaged data.We strongly recommend you to make an Emergency Repair Disk! Click Next to contine...
< Back
Next >
Cancel

Figure 4-26 Emergency Disk Making Pop-up Menu

5.) Press **Next** on pop-up message.

6.) A storage information message appears. Press **Next** to continue.

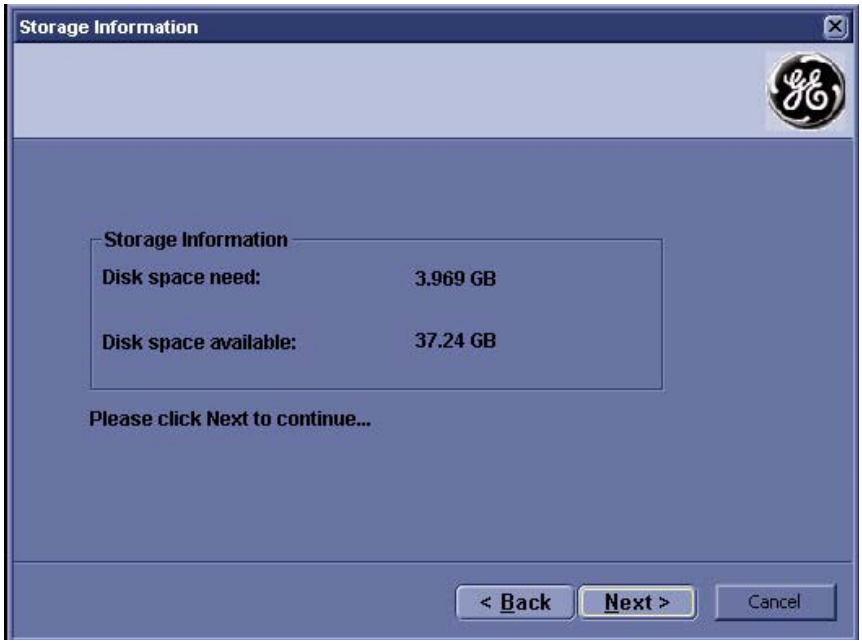


Figure 4-27 Storage Information message

4-3-14-5 Full Backup (cont'd)

7.) Press **Finish** after Emergency Disk Making complete.

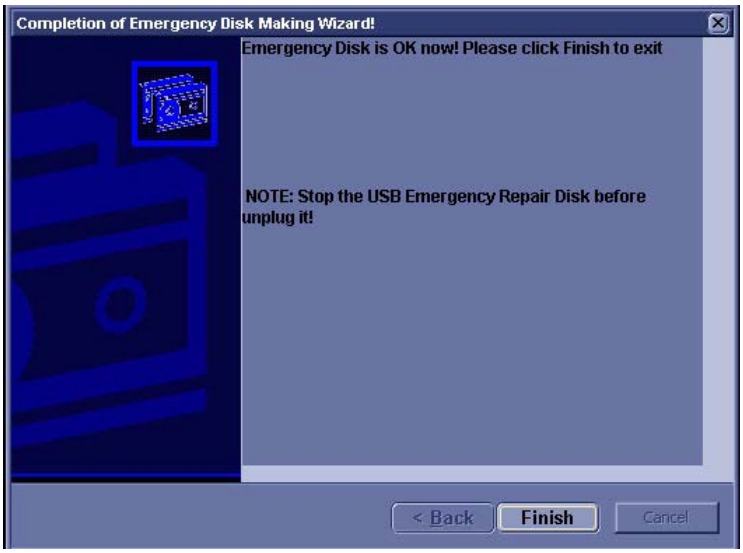

Completion of Emergency Disk Making Wizard!
Emergency Disk is OK now! Please click Finish to exit
NOTE: Stop the USB Emergency Repair Disk before unplug it!
< Back
Finish
Cancel

Figure 4-28 Emergency Disk Making Complete

All databases, presets and images should now be saved to Emergency Disk.

8.) Press Ctrl + R, Emergency Disk Recovery window pop-up appear.

Welcome to Emergency Disk Recovery Wizard
Welcome to Emergency Disk Recovery Wizard!
All the existing data including patient data, archive, preset, servie, report will be overwritten by the USB Emergency Disk! After finish recovery, the system will reboot!Click Next to contine...
< Back
Next >
Cancel

Figure 4-29 Emergency Disk Recovery

9.) Press **Next** on pop-up message.

4-3-14-5 Full Backup (cont'd)

10.) A recovery information message appears. Press **Next** to continue.

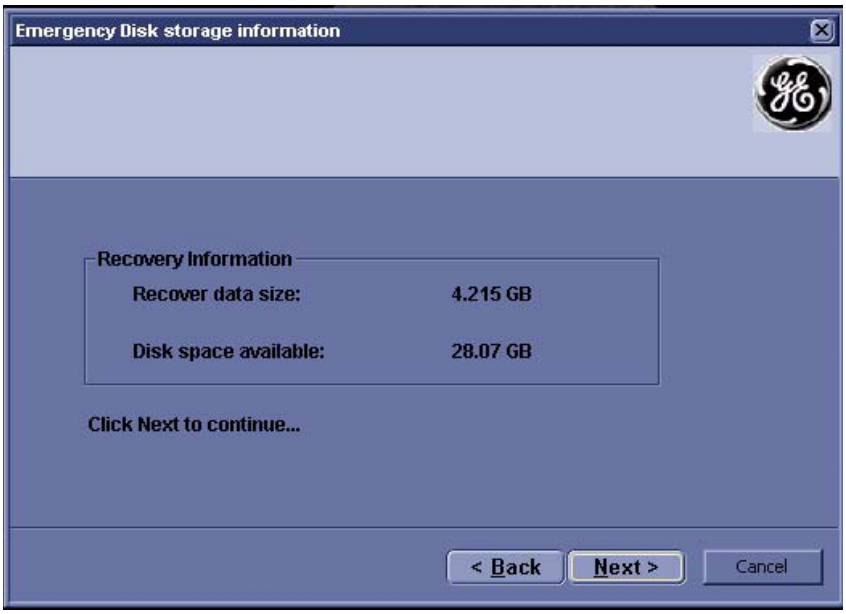


Figure 4-30 Recovery Information message

11.) Press **Finish** after Emergency Disk Recovery complete.

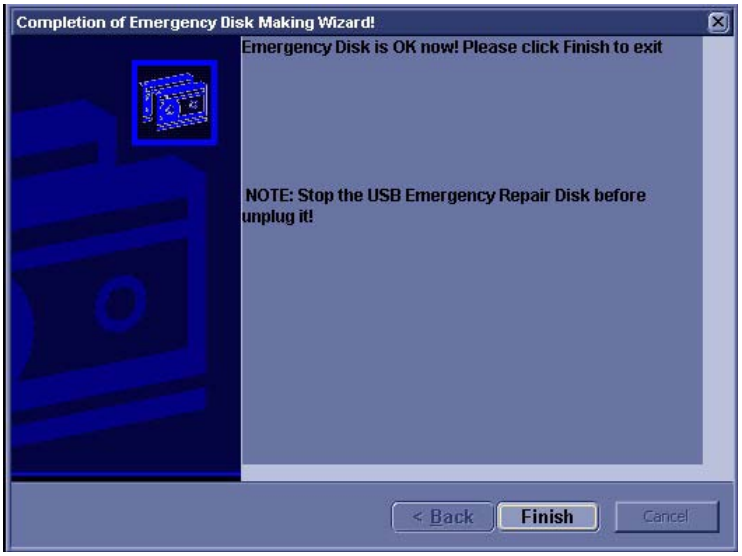

Completion of Emergency Disk Making Wizard!
Emergency Disk is OK now! Please click Finish to exit
NOTE: Stop the USB Emergency Repair Disk before unplug it!
< Back
Finish
Cancel

Figure 4-31 Emergency Disk Recovery Complete

4-3-15 Patient Healthcare Information

Patient Healthcare Information (PHI) is the patient data stored in the USB pendrive/USB HDD inserted in the LOGIQ P3. Ensure that the PHI is erased from the USB pendrive/USB HDD, or the SATA HDD is removed from the LOGIQ P3 system before shipping (repairs/replacement).

In case, if any patient information still resides on the LOGIQ P3, GE contacts the customer to immediately collect the data. However, GE keeps the patient information in a secured environment for a period of one month. The data is deleted permanently after one month.

It is strictly prohibited to sent the PHI outside the confidential patient-doctor environment without encrypting the data. If PHI is sent to GE employees for troubleshooting, the PHI must be encrypted or protected from unauthorized access and the files must be compressed using PKZIP with a password.

The PHI must be sent to GE employees only through the GE intranet. For LOGIQ P3, the GE intranet address is: http://libraries.ge.com/foldersIndex.do?entity_id=12065698101&sid=101&sf=1

NOTE: Do not email the data which includes PHI.

Section 4-4
Software Configuration Checks

Table 4-9 Software Configuration Checks

Step	Task to do	Expected Result(s)
1.	Check Date and Time setting	Date and Time are correct
2.	Check that Location (Hospital Name) is correct	Location Name is correct
3.	Check Language settings	Desired Language is displayed
4.	Check assignment of Printer Keys	The default function for Print1-3 Keys is P1 (store image); P2 (print); P3 (USB Quick Save). Print1-3 Keys can also be assigned as desired by the customer
5.	Check that all of the customer's options are set up correct	All authorized functions are enabled

Section 4-5
Peripheral Checks

Check that peripherals work as described below:

Table 4-10 Peripheral Checks

Step	Task to do	Expected Result(s)
1.	Press (**FREEZE**)	Stop image acquisition.
2.	Press (**P2**) on the Control Panel	The image displayed on the screen is printed on B&W printer.
3.	Connect with Foot Switch on USB port and press once.	To start image acquisition (the same function as (**FREEZE**) key).

Section 4-6PC based products - Vulnerability and Precautions

Most GE Ultrasound (GE U/S) products are PC based, which means they are potentially vulnerable to infection by viruses aimed at PCs. The three ways that viruses spread and how GE U/S products are affected:

Internet - GE U/S products in general do not contain, or do not use the functionality (typically email applications and web browsers) that is used for spreading viruses (or trojan horses) in this way. The only internet connection available from a GE U/S product is to the GE online center, which is done through a secure VPN connection.

Therefore, there is very little risk that GE U/S products will be infected by internet-spread viruses or trojan horses.

Network-worms - All GE U/S products can be networked and are potentially vulnerable to infection. GE U/S has taken and will continue to take precautions to limit this vulnerability.

Removable Disks - GE U/S products support the use of removable disks. But these GE products will actively use the following kinds of disks only:

- GE software installation disks
- Image disks (in DICOM or GE proprietary format)
- GE backup disks

The latter two kinds of disks do not contain files that could contain viruses (executable files or documents that might contain macros). GE U/S takes precautions to make the software installation disks virus free. Auto execution of files on removable disks is disabled by GE U/S products.

Although new computer viruses continue to evolve rapidly in a manner that is difficult or impossible to predict with certainty, there is very little risk that GE U/S products will be infected by viruses from removable disks.

Chapter 5
Components and Functions (Theory)

Section 5-1
Overview

This chapter explains LOGIQ P3's system concepts, component arrangement, and subsystem function. It also describes the Power Distribution System (PDS) and probes.

Table 5-1 Contents in Chapter 5

Section	Description	Page Number
5-1	Overview	5-1
5-1-1	Block Diagram - Logiq P3	5-2
5-2	PWA Assy Diagrams	5-11
5-3	Power Diagrams	5-22
5-4	Common Service Platform	5-24
5-5	RFS (Request for Service)	5-26
5-6	Machine RFS	5-28

5-1-1 Block Diagram - Logiq P3

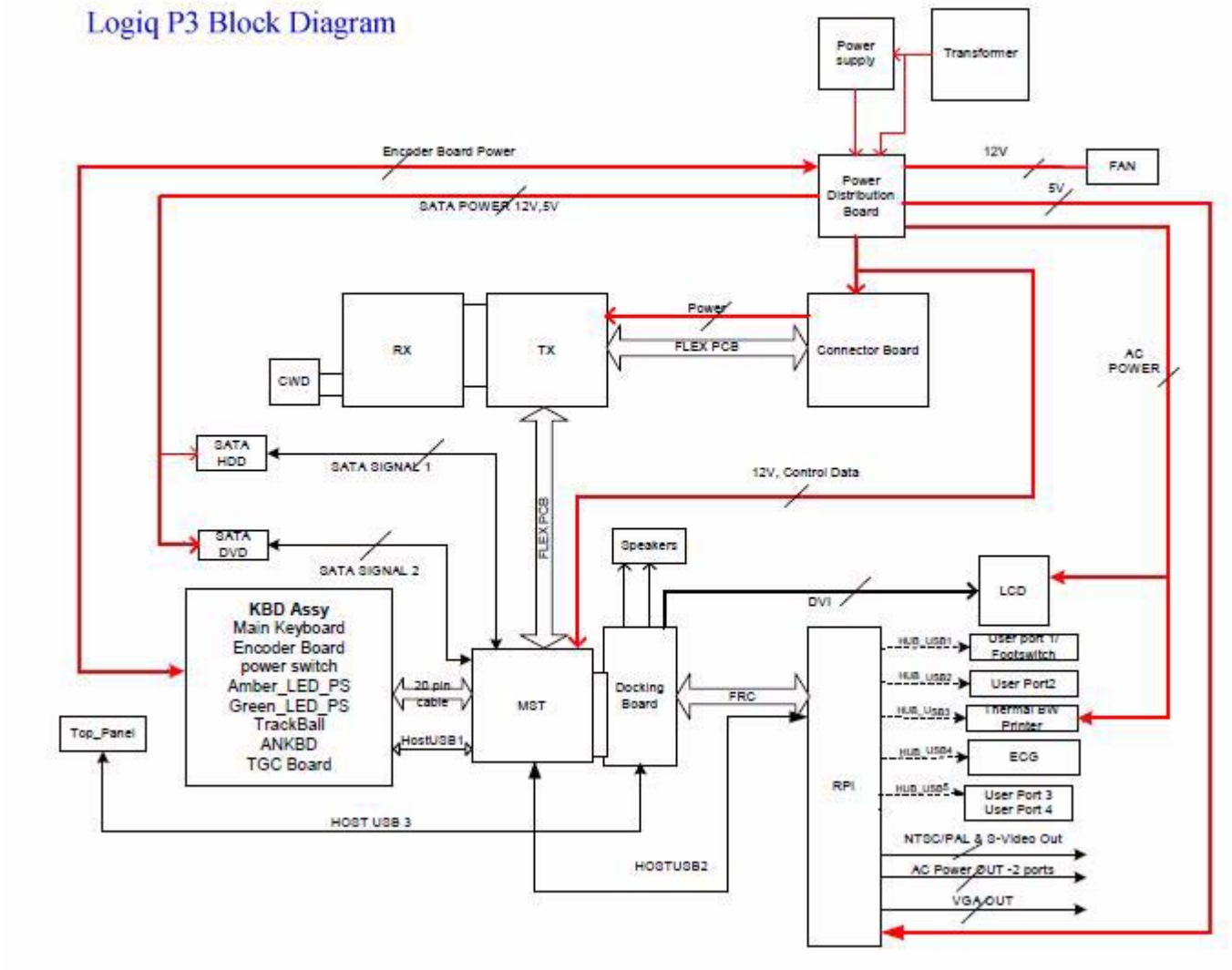


Figure 5-1 Logiq P3 System Block Diagram

5-1-2 Block Diagram - LOGIQ P3 BT10

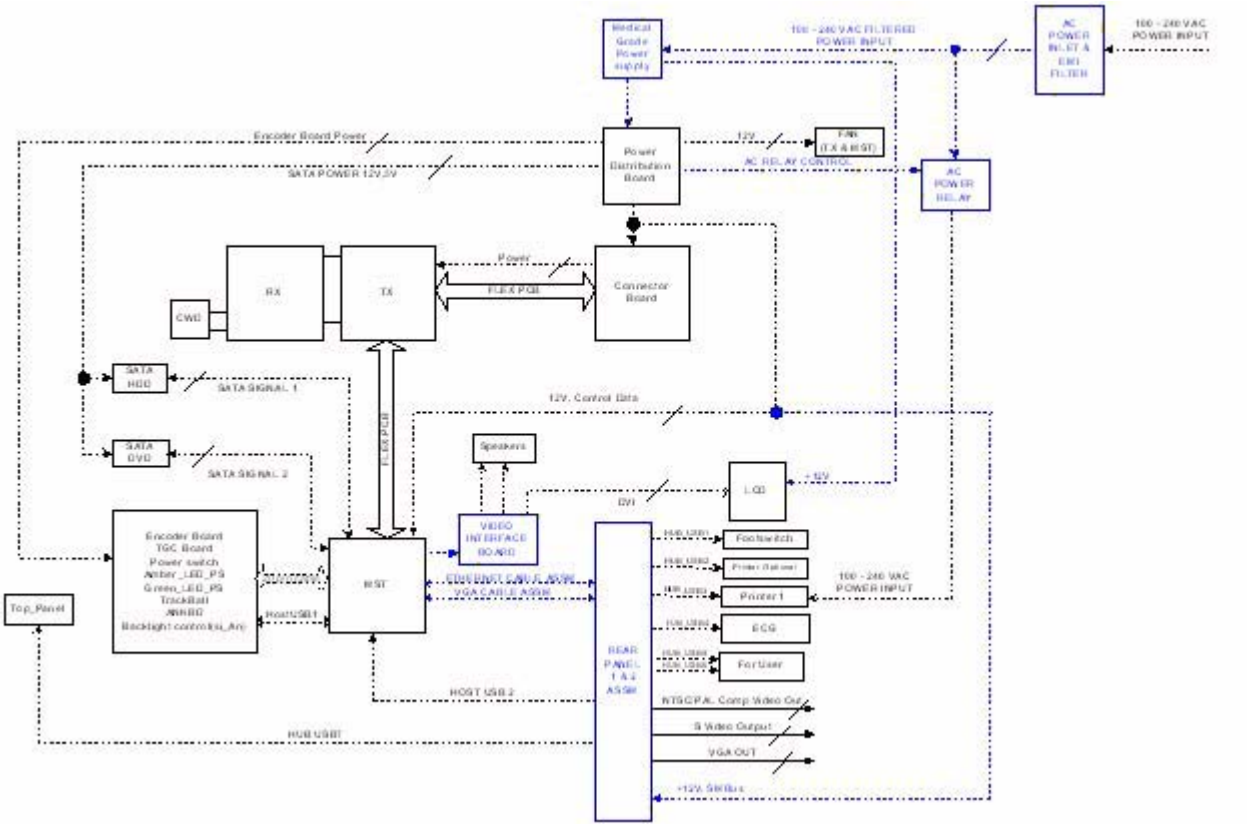


Figure 5-2 LOGIQ P3 BT10 System Block Diagram

5-1-3 General Information

- LOGIQ P3 is an ultrasound imaging scanner.
- The system can be used for:
  - 2D Black and White imaging
  - 2D Color Flow
  - M-Mode Black and White imaging
  - Doppler
  - A number of combinations of the above
- LOGIQ P3 is a digital beam forming system that can handle up to 192 elements linear probes.
- Signal flow from the Probe Connector Panel to the Front End, to the Mid Processors and (TMST) and finally to the LCD and peripherals.
- System configuration is stored on a hard disk and all necessary software is loaded from the hard disk on power up.

5-1-4 Front End

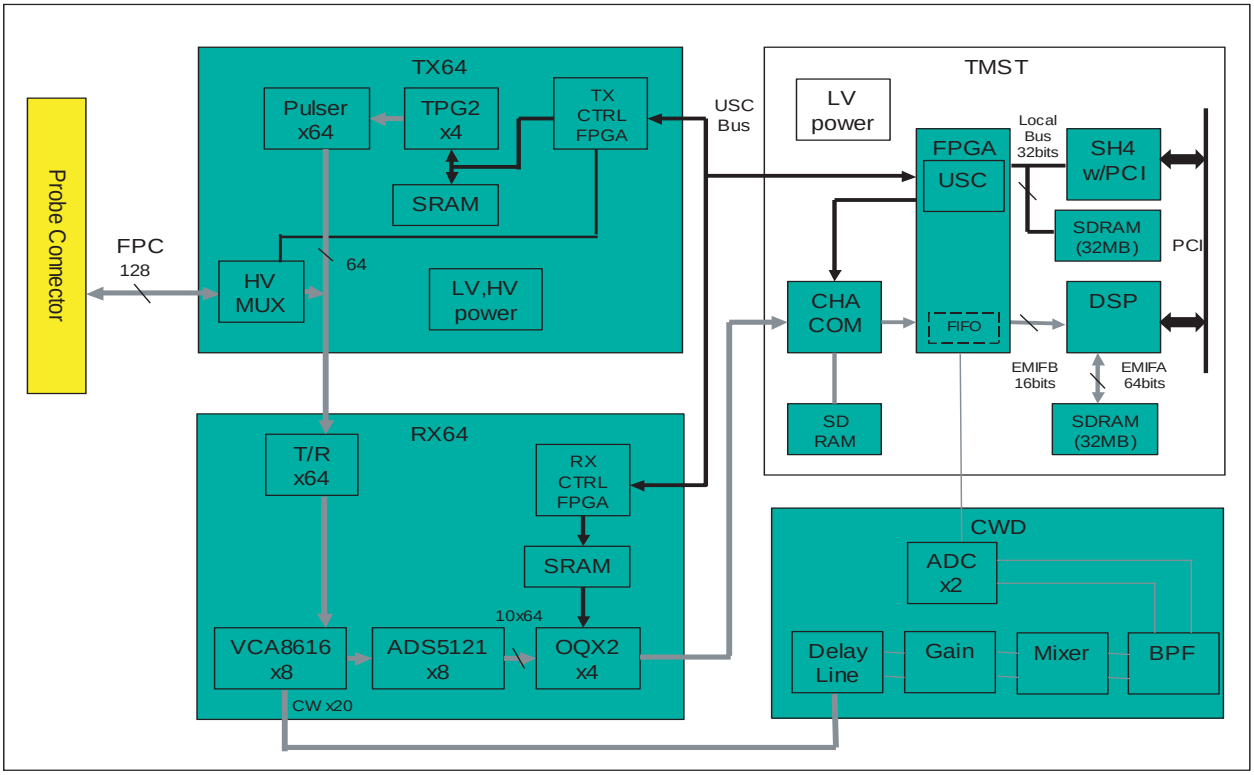


Figure 5-3 The Front End

The front end generates the strong transmit bursts, transmitted by the probes as ultrasound into the body. It also receives weak ultrasound echoes from blood cells and body structure, amplifies the signals and converts them to a 10bit digital signal.

The digital representation of the signal is presented to the mid processor section.

- PAM(PreAmplifier): The preamplifier amplifies 64 echo signals. The reception signals are sent to ADC on RX64.
- RX64 (LOGIQ P3 Front Processor): Convert the analog echo signal to digital.
- TX64 (LOGIQ P3 Transmission Board):This has 64 channel bipolar drivers.

5-1-5 The Back End

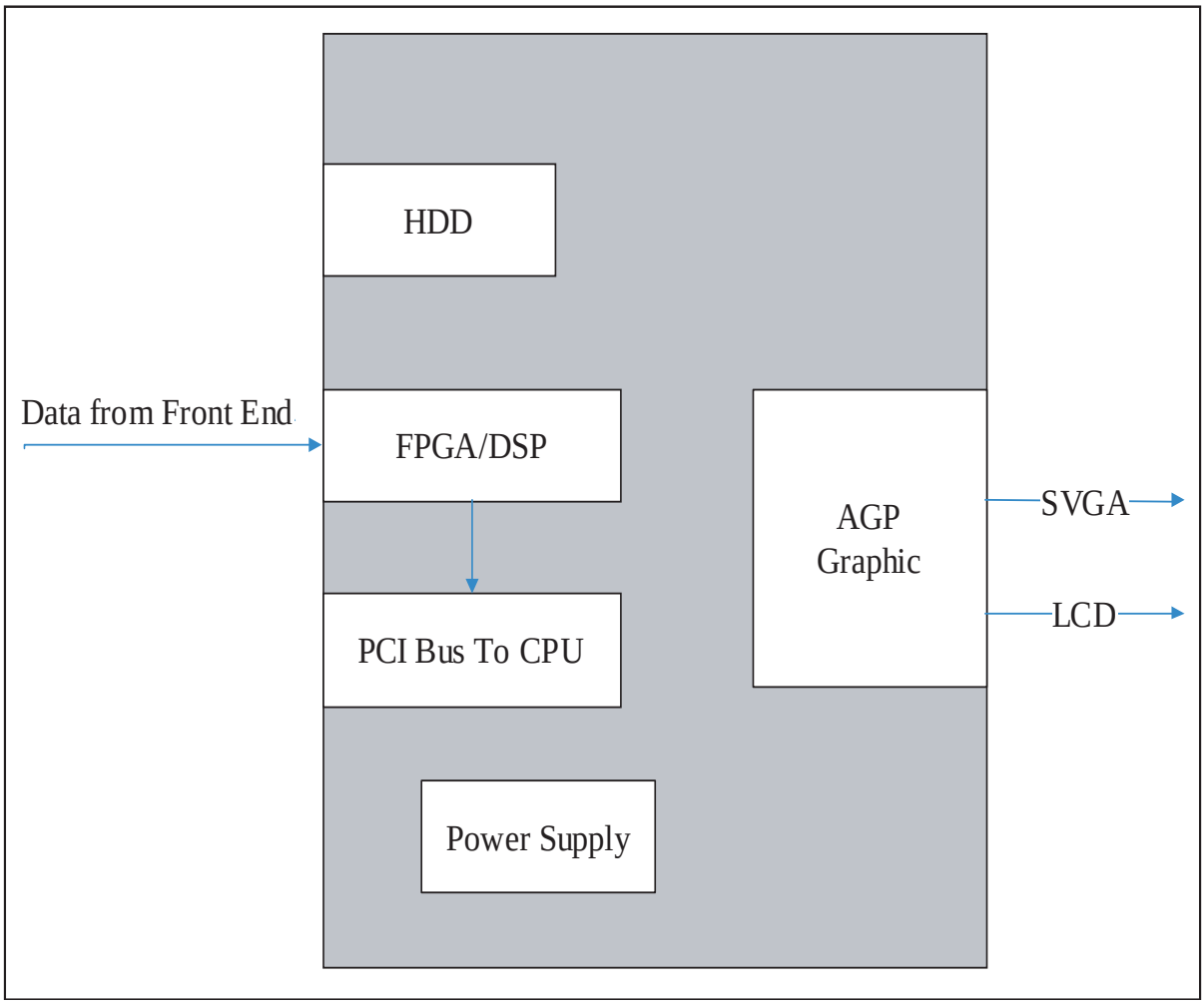


Figure 5-4 The Back End

The TMST grabs the data from the Image Port, stores it in a memory, performs scan conversion to pixel domain and drives the system LCD display.

5-1-6 Top Console

The Top Console includes a Standby/On switch, a keyboard, different controls for manipulating the picture quality, controls for use in Measure & Analyze (M&A), and loudspeakers for stereo sound output (used during Doppler scanning).

Figure 5-5 Top Console

5-1-7 External I/O

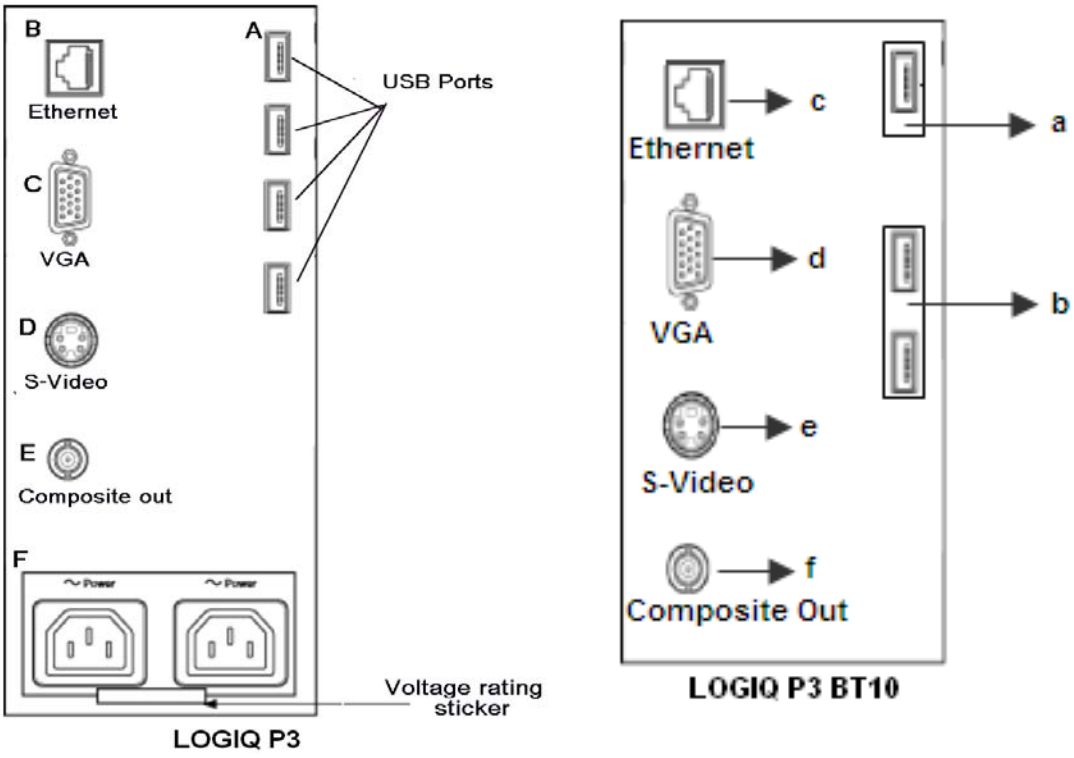


Figure 5-6 External I/O module overview

External I/O:

The external I/O is the interface between the scanner and all external items. Examples:Network, USB interface medical grade printer and external medical grade SVGA displayer.

5-1-8 Peripherals

DVR, Color printer, Footswitch, VGA monitor, TV and a Black & White Printer and Bluetooth printer can be connected to the external I/O.

5-1-9 Wiring

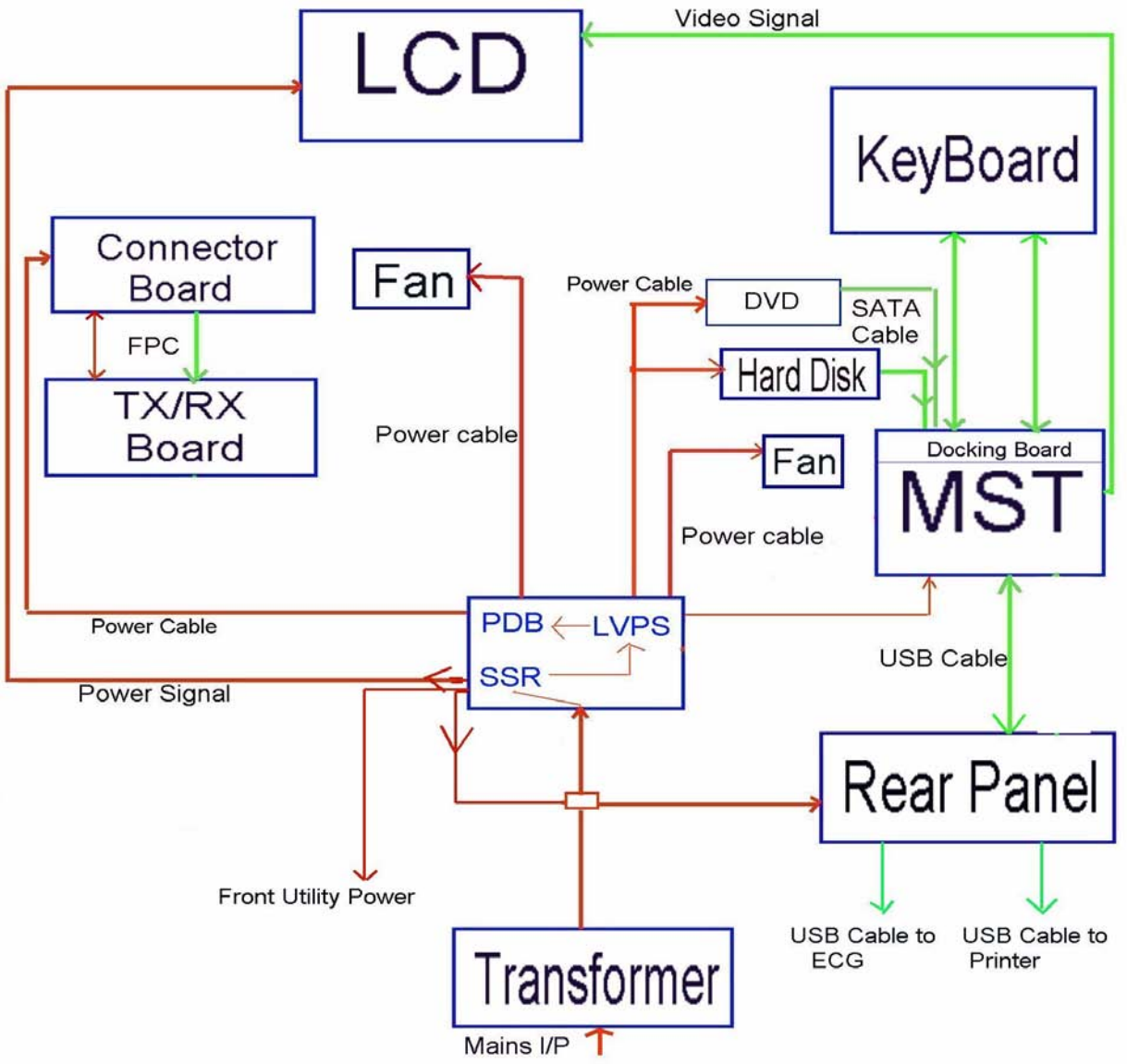


Figure 5-7 Wiring Diagram (LOGIQ P3)

- TX64: LOGIQ P3 Transmit board
- RX64: LOGIQ P3 Front end processing board
- MST: LOGIQ P3 Master board
- PWR SW: Power Switch
- FPC: Flexible Print Circuit board
- PDB: Power Distribution Board
- SSR: Solid State Relay

5-1-9-1 Power Up sequence description

5-1-9-1-1 Overview

The Power Up sequence can be divided into the following steps:

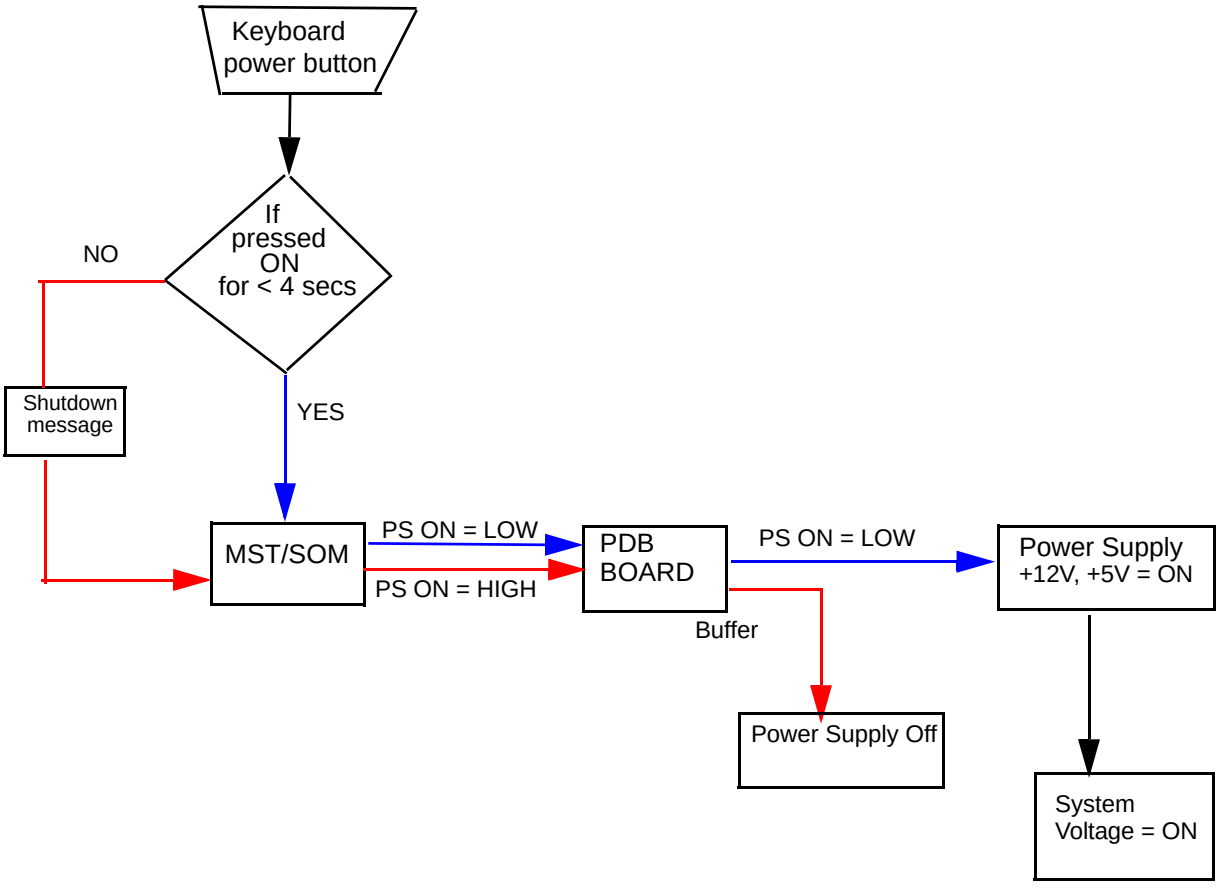
1.) Switch ON the mains on the Power entry module.
2.) +5V standby is provided to SOM/MST.
3.) MST detects contact of the Power ON button and provides input to SOM and the power supply unit, which will power ON enabling the 12V and 5V to the entire system.

5-1-9-2 Power Down sequence description

5-1-9-2-1 Overview

There are two ways to switch off the system:

1.) Select shutdown from the Application.
2.) Keep the Keyboard ON/OFF button pressed for more than 4 seconds.



Blue color indicates Power On sequence
Red color indicates Power Off sequence

Figure 5-8 On/Off Sequence

Section 5-2PWA Assy Diagrams

5-2-1 TMST

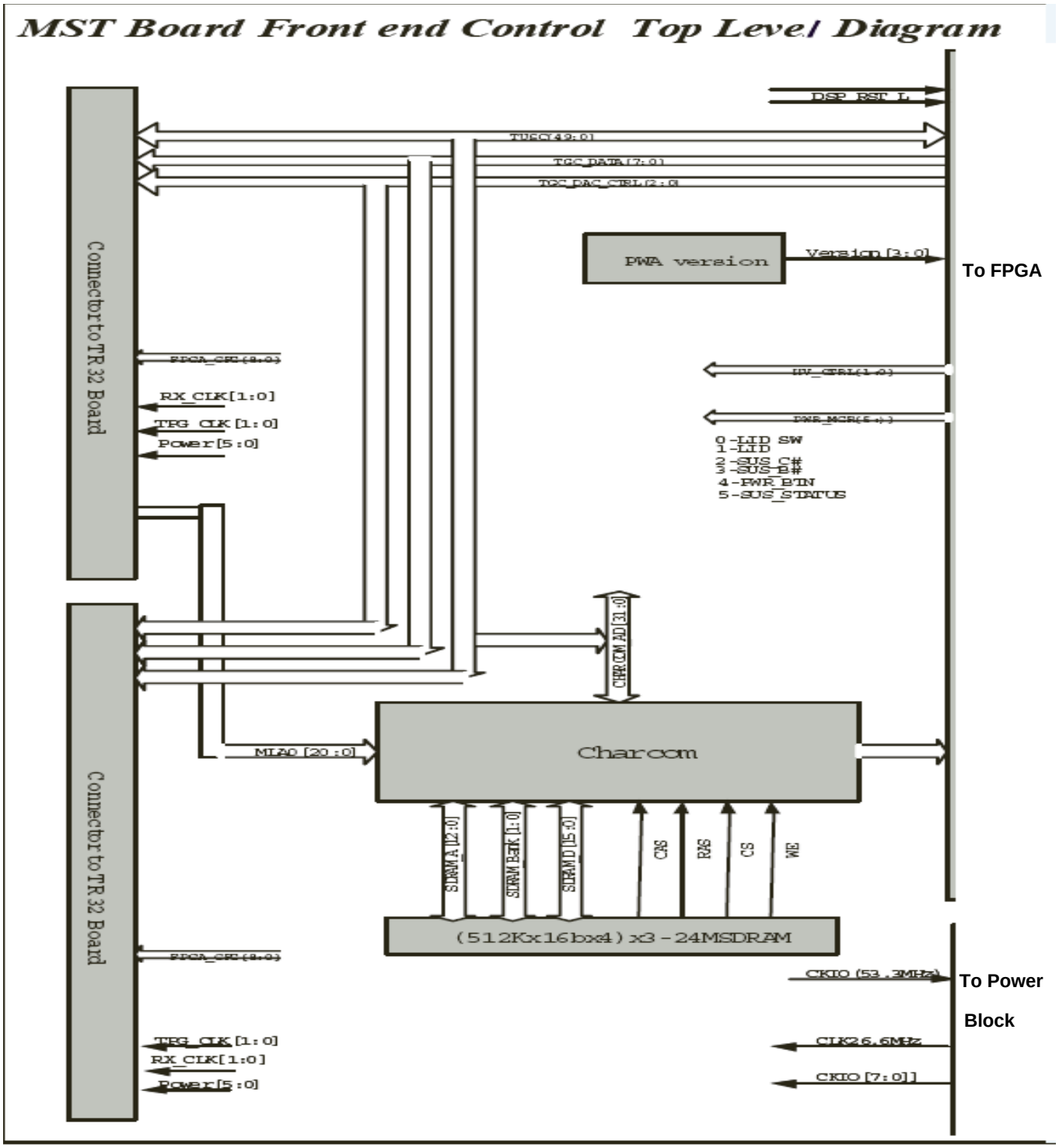
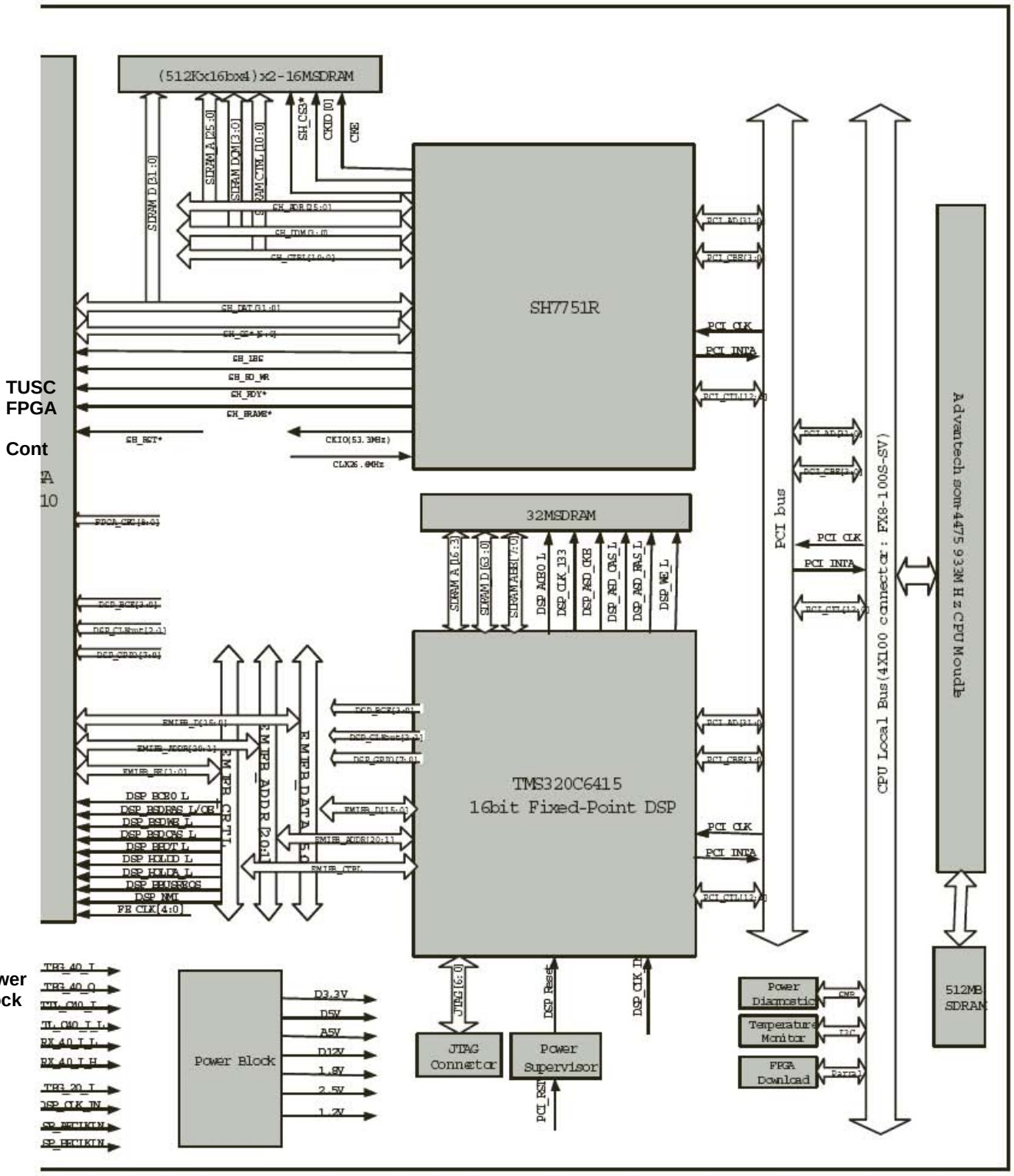


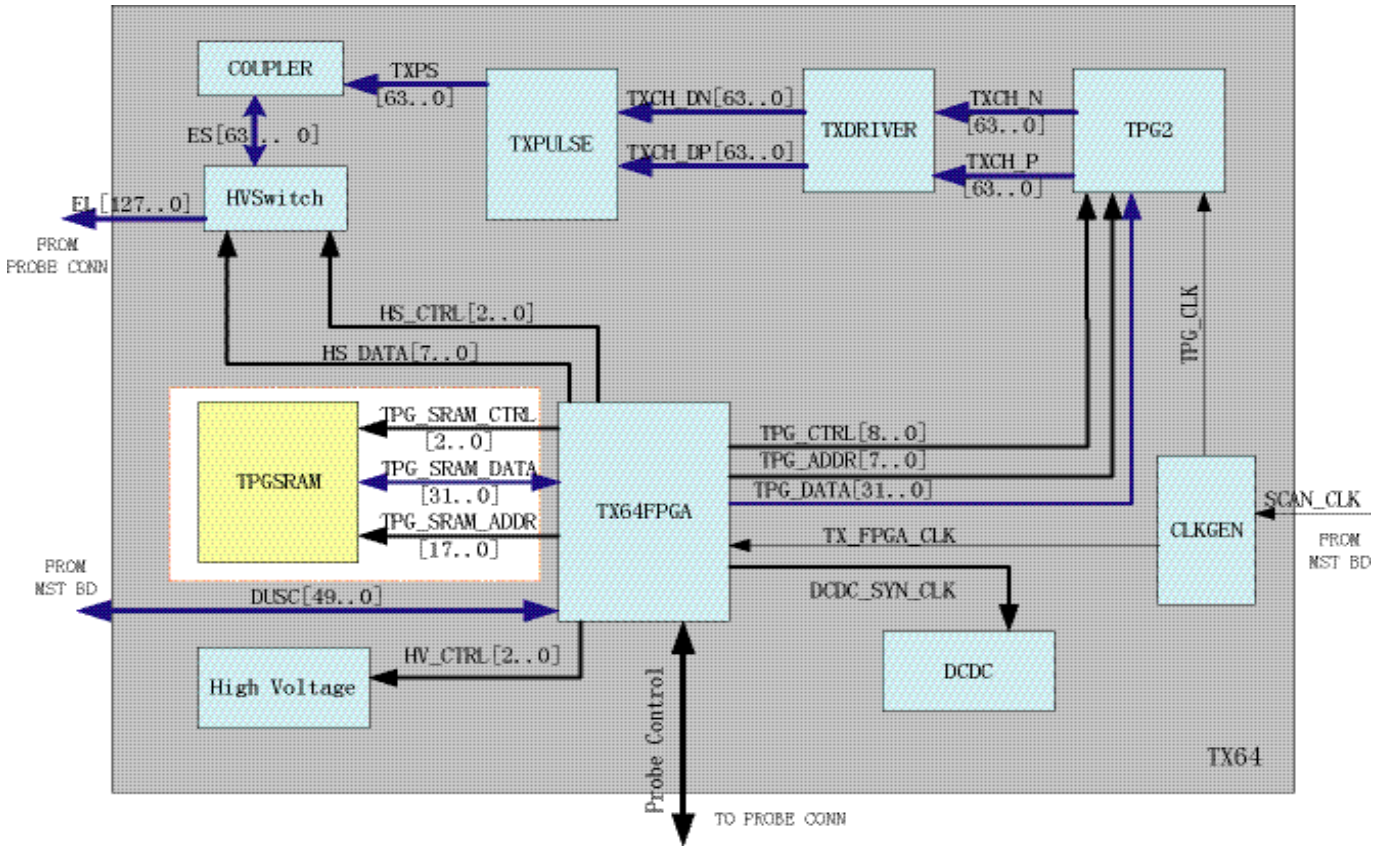
Figure 5-9 TMST Block Diagram

5-2-1 TMST (cont'd)



TMST Block Diagram (cont'd)

5-2-1 TMST (cont'd)



- SH4: Front controlling CPU
- PWR_DIAG: Power diagnostic circuit
- ETX: Card CPU unit

5-2-1-1 Description

This diagram describes the TMST board. It controls the front end of LOGIQ P3 and also communicate with PC system through PCI interface.

The main function:

- Generate clock signal and distributing each clock signal.
- Generate DUSC bus cycle.
- Power diagnostics: HV, LV.
- Transmit image raw data (B/CFM/DOP) to PC after assembling packet including header information.

5-2-2 RX64

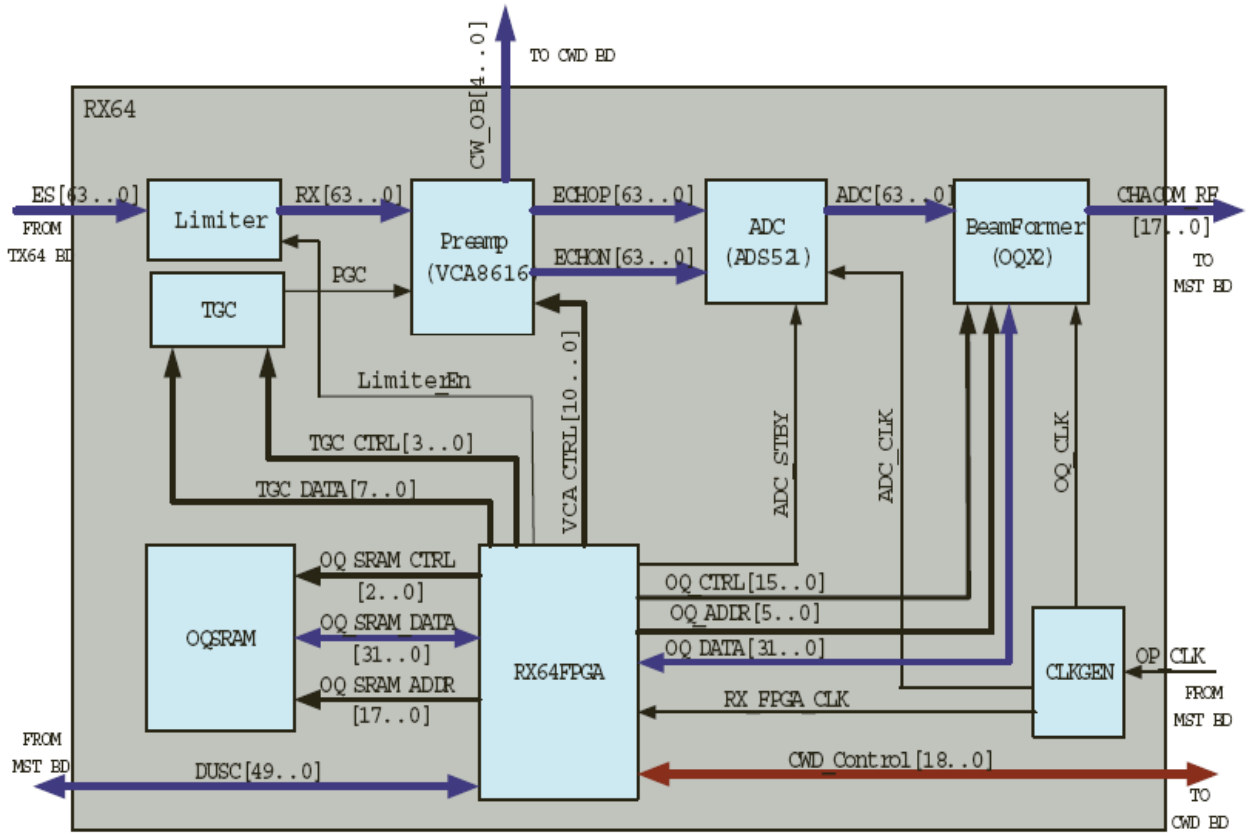


Figure 5-10 RX64 Block Diagram

- RX64: LOGIQ P3 Front End Processor board
- ADC: Analog/Digital converter
- OQX2: Beamform ASIC
- CHACOM: B/M/CFM/Dop signal processor ASIC
- FPIC FPGA: Front Process interface control

5-2-2-1 Description

This diagram describes the RX64 (Front Process) board. It resides below TX board (located at the bottom layer).

The main function:

- Convertor 64 channels echo which is from preamp to digital signal.
- Focus the received RF signals by digital beamforming technology.
- Control CHACOM to acquire optimum image data.

5-2-3 TX64

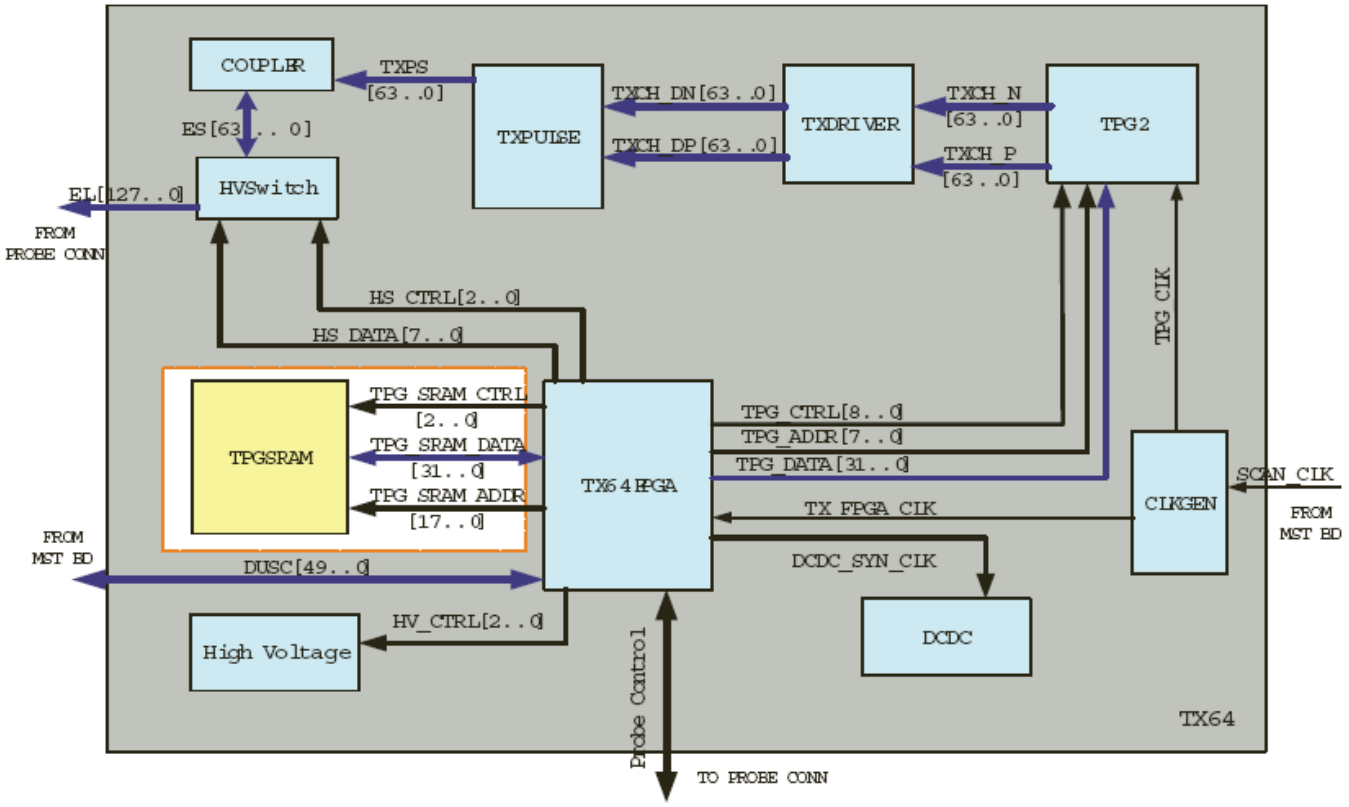


Figure 5-11 TX64 Block Diagram

- TX64: LOGIQ P3 Transmit board
- TPG2: Transmit Pulse Generator
- TMST: LOGIQ P3 Master board
- TXMX FPGA: Transmit and MUX controlling FPGA

5-2-3-1 Description

This diagram describes LOGIQ P3 TX64 board.

The main function:

- Generate the transmit pulse.
- Drive the Tx pulse with high voltage.

5-2-4 CWD

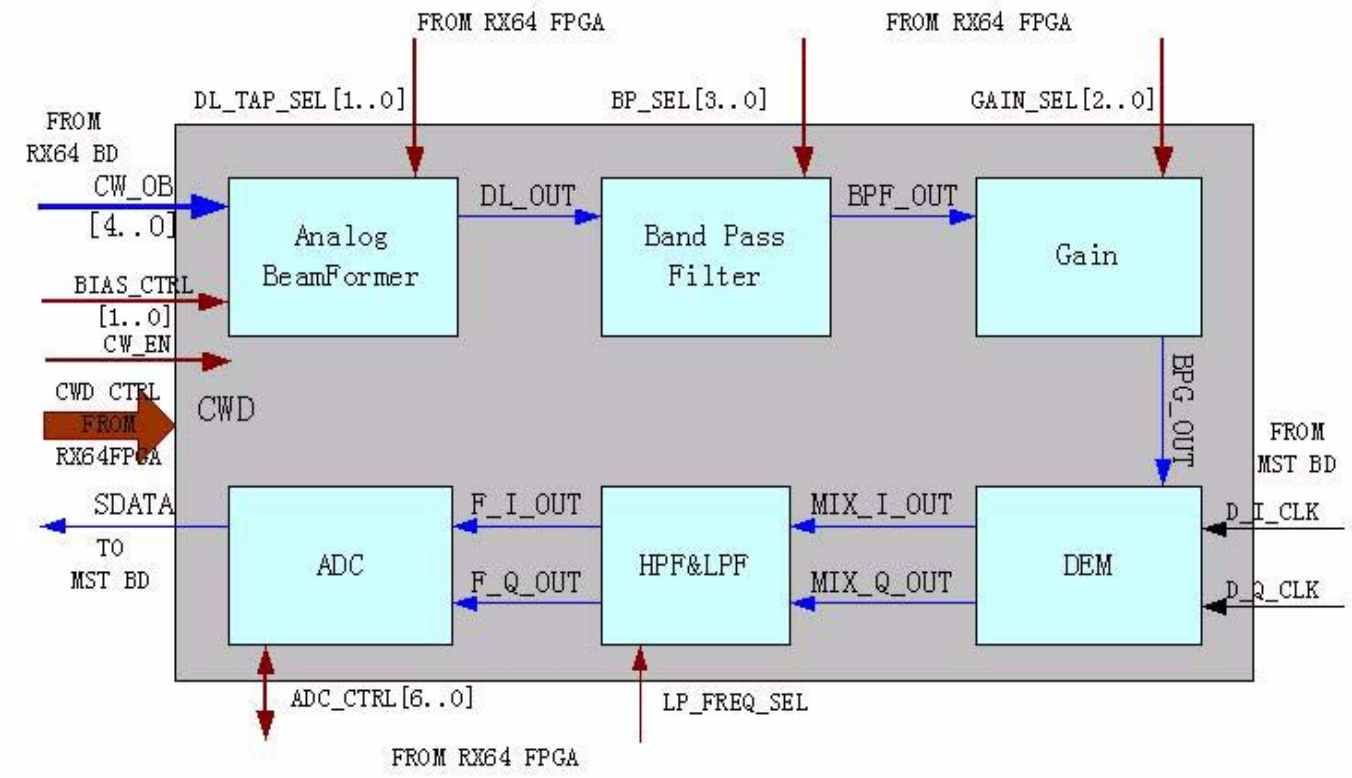


Figure 5-12 CWD Block Diagram

- CWD: Continue wave doppler board
- DEM: Demodulator
- HPF: High pass filter
- LPF: Low pass filter

5-2-4-1 Description

This diagram describes LOGIQ P3 CWD board, it resides under RX64 board.

The main function:

- Generate continue wave form image data.

5-2-5 Connector Board

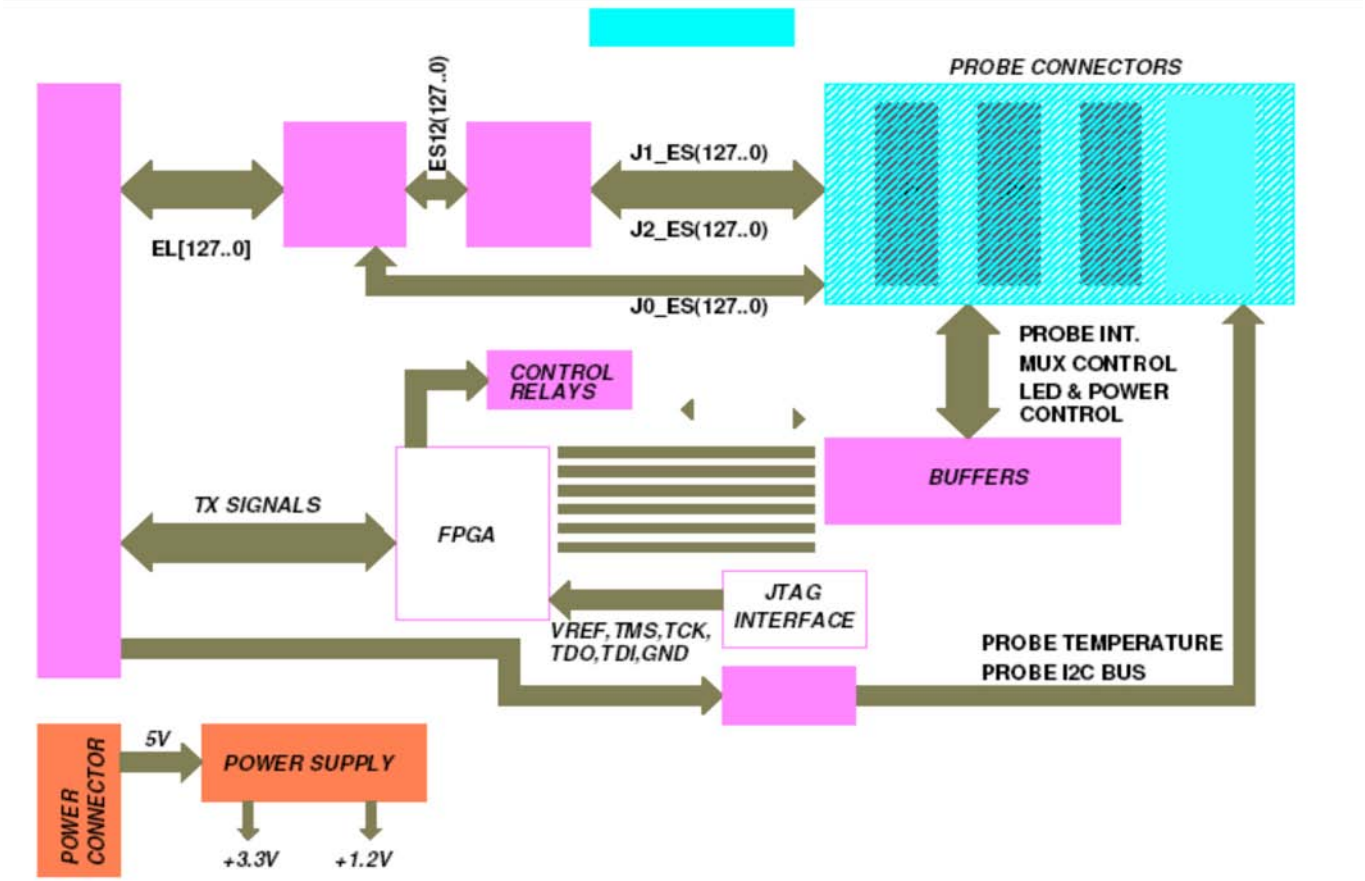


Figure 5-13 Connector Board Block Diagram

- There are 3 banks of relays on the Connector Board one each for each probe connector.
- There is one FPGA that acts like a buffer for the Probe related signals and is the interface between the probe and the main TX Board FPGA. There is a I2C slave also implemented on this FPGA that responds and interfaces with the Host I2C controller on the TX board it is mainly for probe selection and control
- The Power supply to the TX board from the PDB board is connected via the Connector Board.

5-2-6 Rear Panel-1 & Rear panel 2

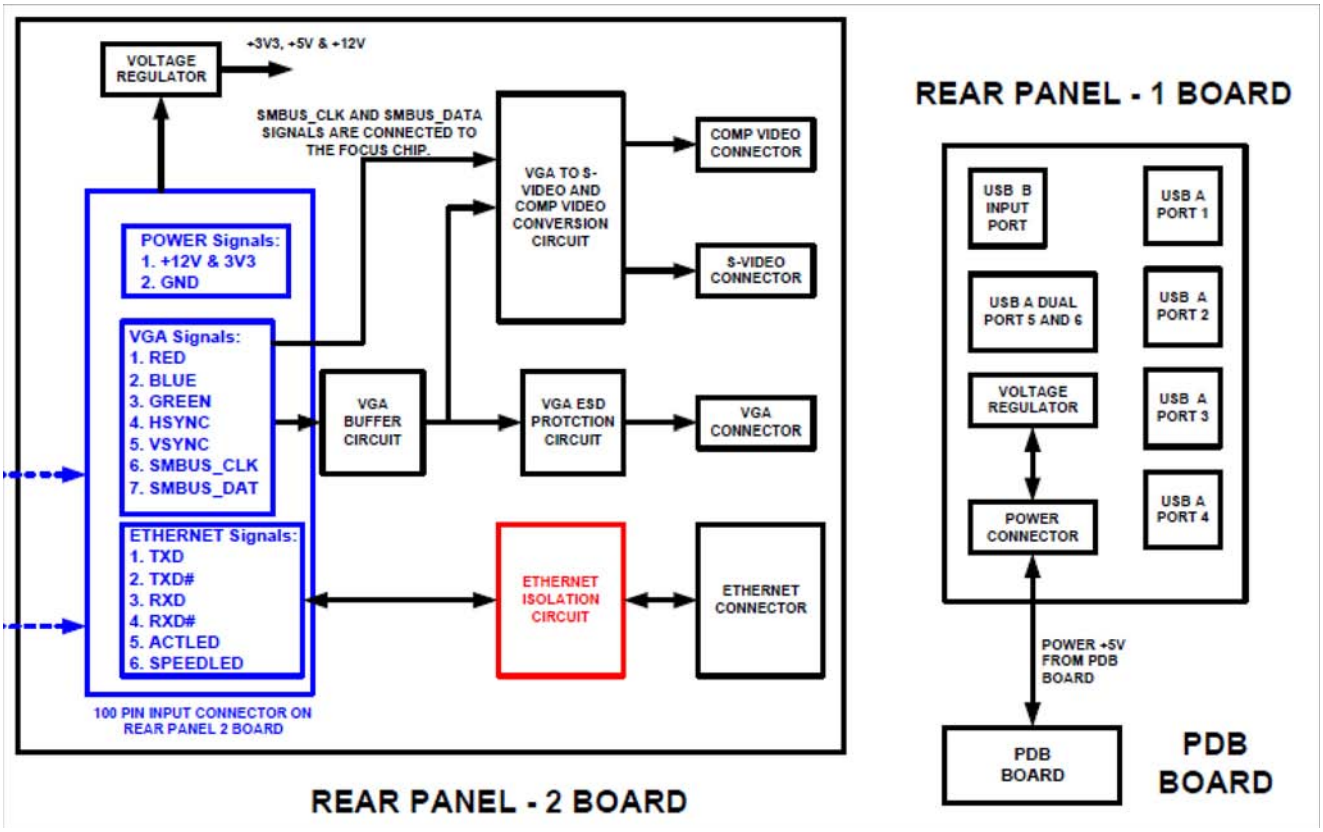


Figure 5-14 Rear Panel 1 & 2 (LOGIQ P3)

- Rear panel provides all the external interfaces to the user like 1 ethernet port, 1 VGA port, 4 USB ports, BNC Connector and one S-Video connector.
- The Ethernet signals and VGA signals are directly routed from the MST board via the FRC cable with buffering. For the Video out signals (BNC and S-Video) there is a video conversion logic built which converts the VGA input into the S video and Composite video formats.
- The resolution of the Video output would be 640x480.
- Power supply to the rear panel is connected from the PDB board.

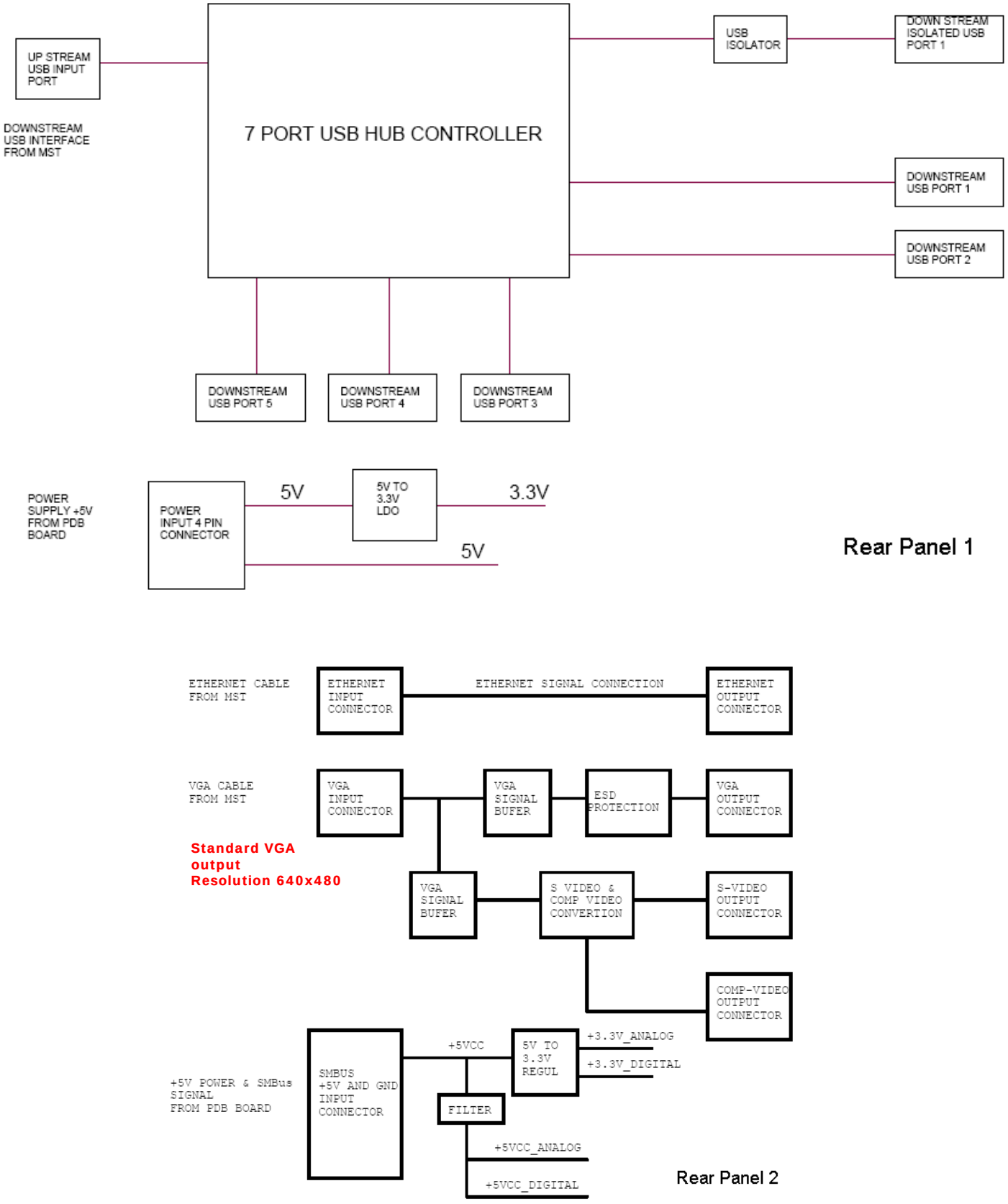


Figure 5-15 Rear Panel 1 & 2 (LOGIQ P3 BT10)

5-2-7 Keyboard

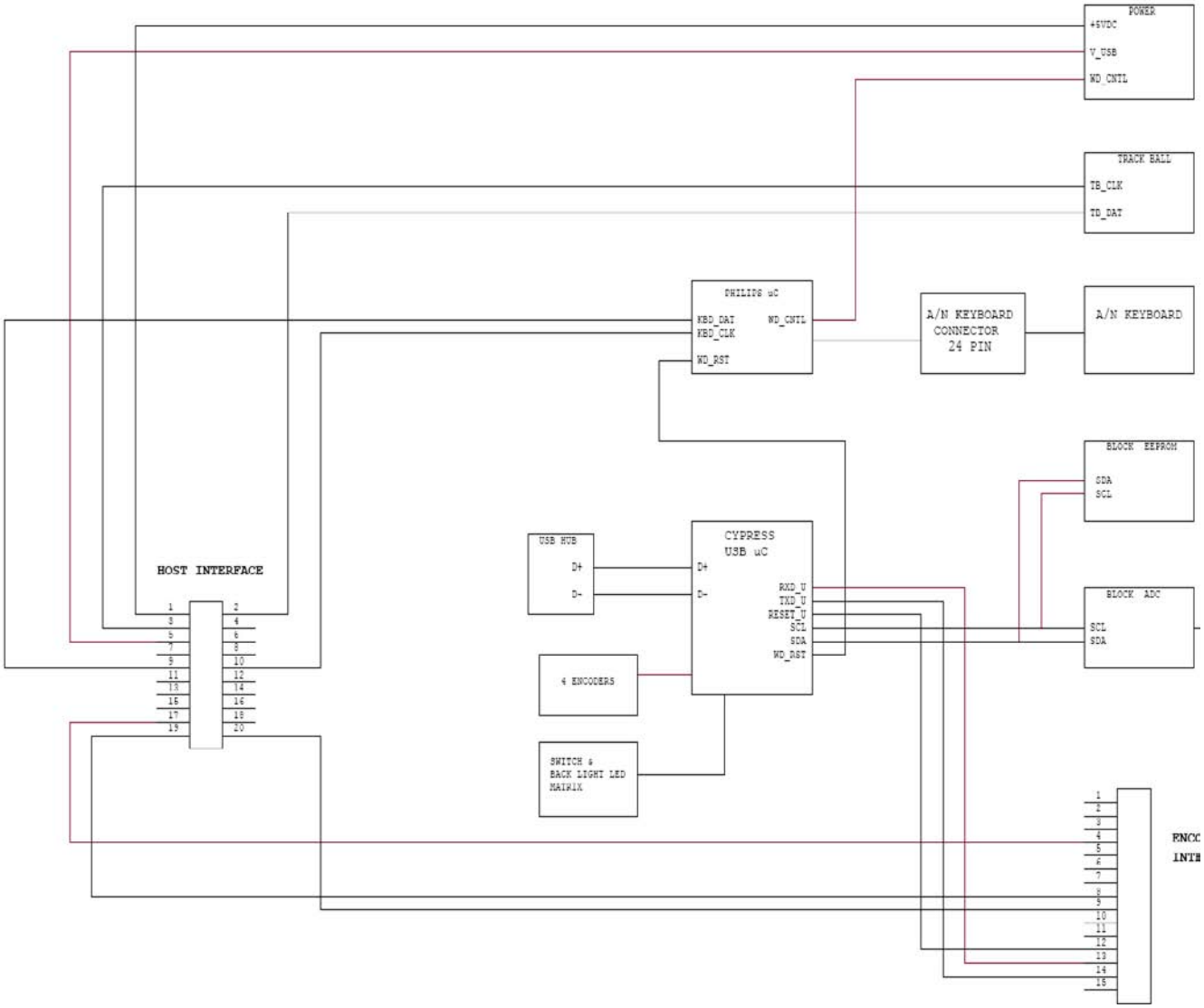


Figure 5-16 Keyboard Block Diagram

Keyboard has the following main interfaces:

1.) USB controller that interfaces the Keyboard to the System SW. The ultrasound Keys are directly mapped to this controller.

2.) Trackball and Alphanumeric Keyboard is connected to the system via the PS2 interface. There is one Microcontroller that decodes the Alphanumeric key press information and relays this information to the system via the PS2.

3.) One USB port is extended from the MST board and is available on the Keyboard.

5-2-7-1 Indicator LEDs

Table 5-2 LED Indications

Function Module	LED Location	LED Color	LED Function
Control panel	Power switch	Amber When StandBy, Turns Green when switched ON.	Main Power activity
RX64	DS1	Green (Normal Condition)	FPGA Config
TX64	DS1	Green (Normal Condition)	FPGA Config
PDB		Green (Normal Condition)	+5v
		Green (Normal Condition)	+12v
		Green (Normal Condition)	+5v_ Stand by
Connector Board	D5	Green (Normal Condition)	Probe 1 Connected
	D6	Green (Normal Condition)	Probe 2 Connected
	D7	Green (Normal Condition)	Probe 3 Connected

Section 5-3
Power Diagrams

5-3-1 Overview

The AC Power assy's main tasks are to isolate and output to the AC/DC unit which is inside the system console. The input of AC power pack will be the AC outlet, the range is AC 100v Min & 240v Max configuration support is available in power pack.

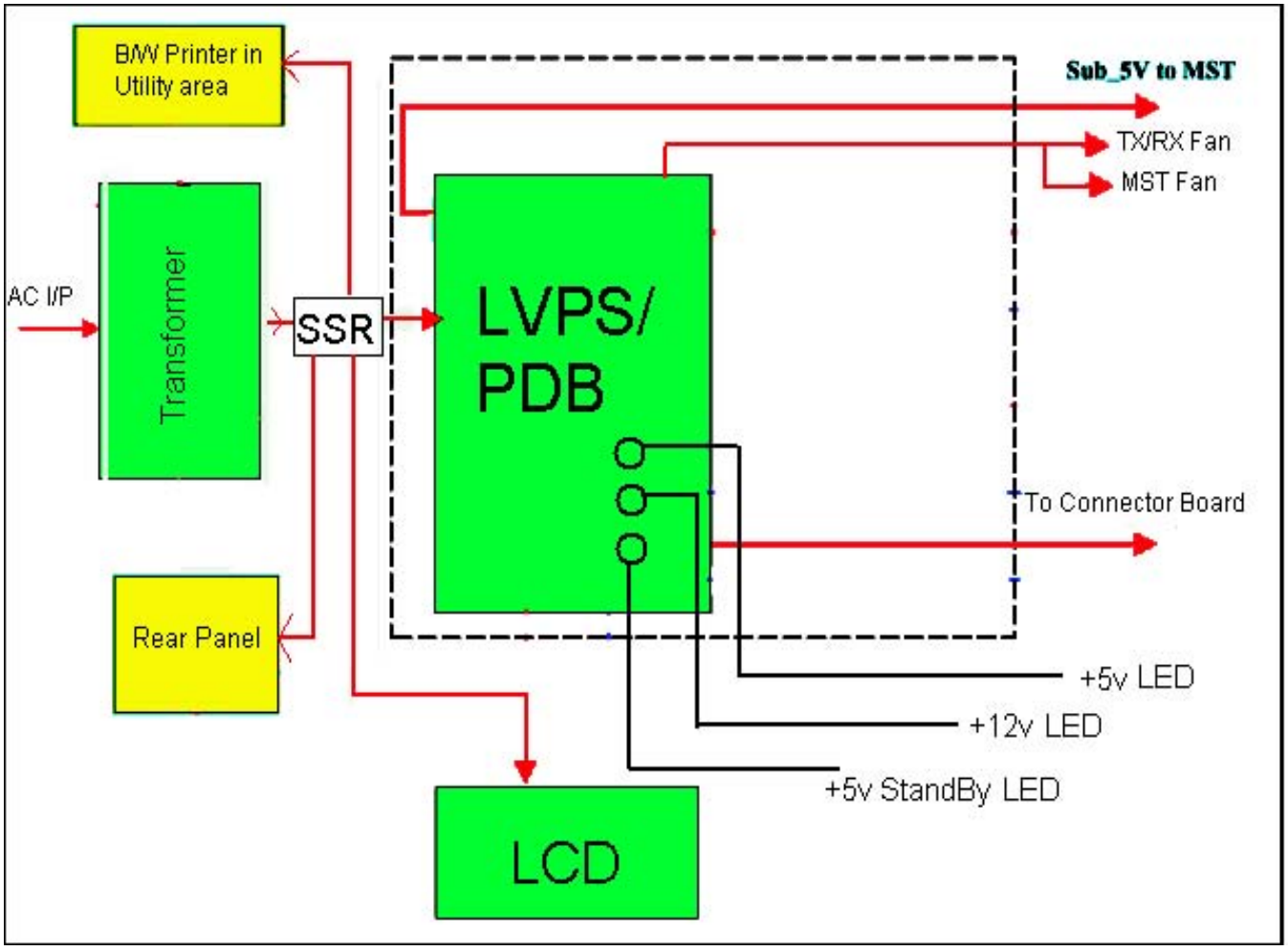


Figure 5-17 AC Power Distribution Block Diagram (LOGIQ P3)

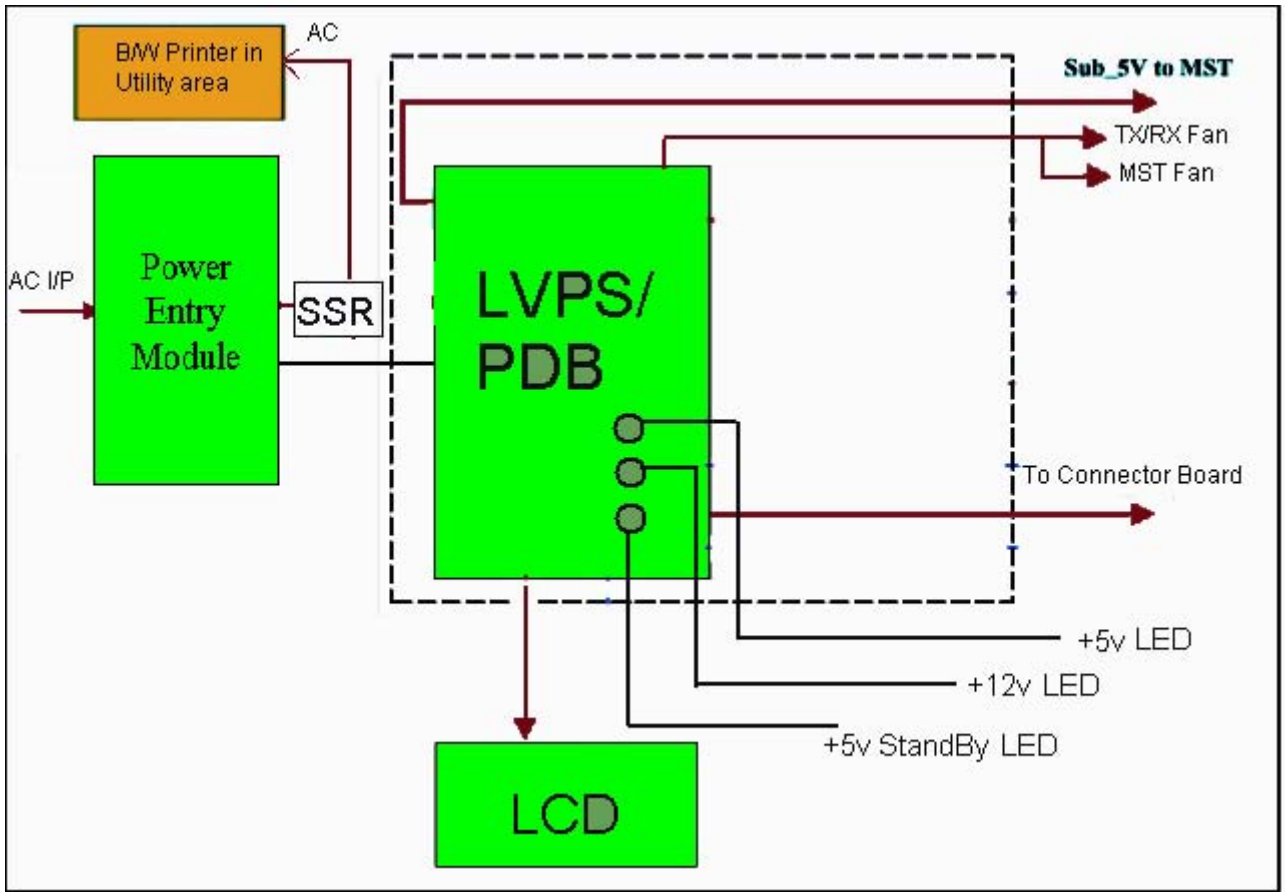


Figure 5-18 AC Power Distribution Block Diagram (LOGIQ P3BT10)

The mains cord has plugs in one side end (On Wall). A male plug (of Power Cord) connects to the mains outlet on site.

From the Main Circuit Breaker, the AC power is routed via an Inrush Current Limiter to a internal outlet connector for the Main power supply. The power ON OFF is actually controlled by the MST PWA. This signal is routed from the Keyboard ON OFF button to the MST board and then to the PDB board.

The MST board has logic that controls the state of this signal. The output from this logic is connected to the PDB board that either switches on or switches off the Power supply.

Section 5-4
Common Service Platform

5-4-1 Introduction

The Service Platform contains a set of software modules that are common to all PC backend ultrasound and cardiology systems. The Common Service Platform will increase service productivity and reduce training and service costs.

5-4-2 Global Service User Interface (GSUI)

5-4-2-1 Internationalization

The user interface provided by the service platform is designed for GE personnel and as such is in English only. There is no multi-lingual capability built into the Service Interface.

5-4-2-2 Service Login

Select Utility->Service. This button links the user or the Field Engineer (FE) to the service login screen.

Figure 5-19 Service Login Screen

5-4-2-3 Access / Security

The service interface has different access and security user levels. Each user is only granted access to the tools that are authorized for their use.

*NOTE: A Service Dongle is necessary for use by GE Service when performing proprietary level diagnostics. OnLine Center access to the scanner requires the password and they must have '**Disruptive**' permission and customer input to run diagnostics.*

5-4-2-3 Access / Security (cont'd)

Table 5-3 Service Login User Levels

User Level	Access Authorization	Password
Operator	Authorized access to specified diagnostics, error logs and utilities. Same acquisition diagnostic tests as GE Service.	uls
Administrator		uls
External Service		gogems
GE Service	Knowledge of a service level password. A physical Service Key (Dongle) required	rotating security password

NOTE: For a GE Field Engineer, the password changes at specific intervals. Access with the password is tied to the service key.

Every access request, whether successful or not, will be logged into a service access log that is viewable to authorized users.

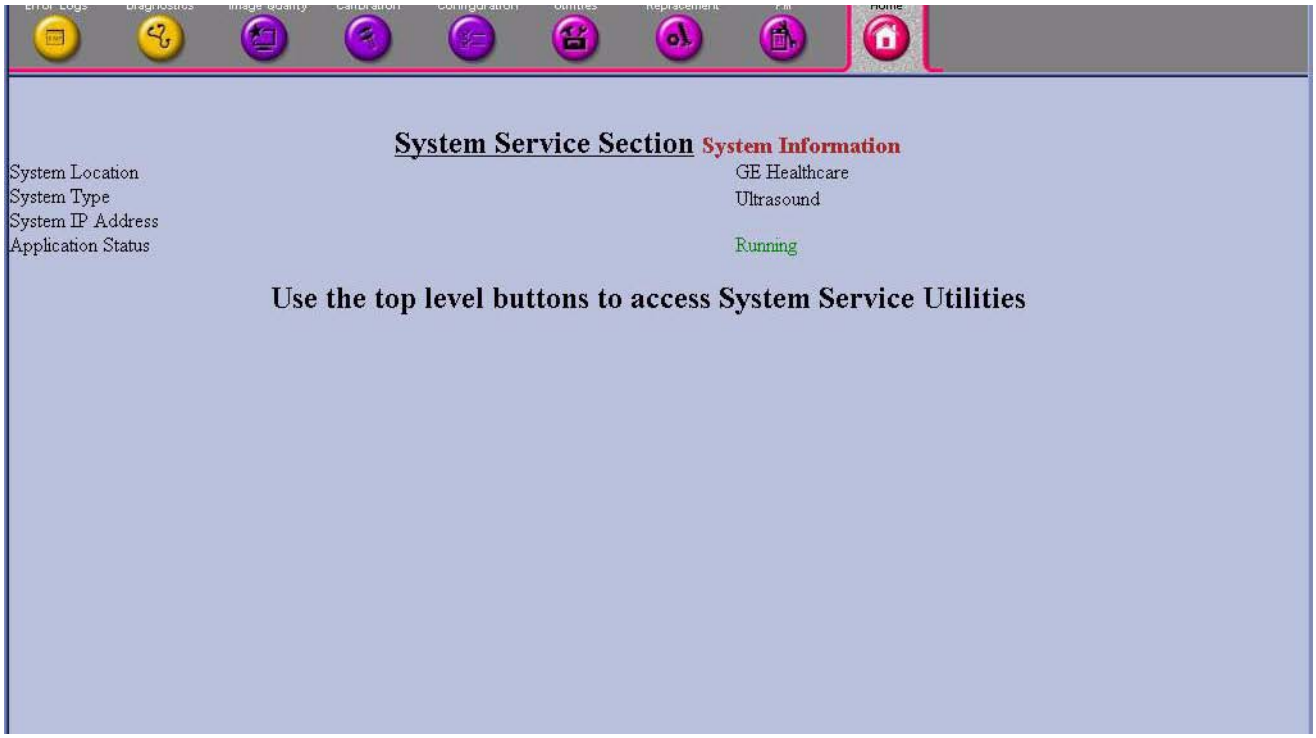


Figure 5-20 Customer Service Home Page

5-4-2-4 For a service call with no FRU replacement, use the following debrief Script:

Refer the Service Manual, Chapter 4: Basic Functional Checks in the service manual. Equipment has passed all the required tests and is ready for use.

Section 5-5RFS (Request for Service)

5-5-1 General

This describes general RFS functionality.

RFS function is a call for service to be used by customer or FE directly from the system instead of calling GE Cares.

5-5-2 Sending RFS Procedure

Service Platform should be turned off in order to open RFS window.

System must be connected to network, configured and checked out to be able to send the RFS.

1.) Right Click on “Connect to GE” icon.

Figure 5-21 Contact GE icon

All the fields that are marked with asterisk * are mandatory and should be filled in order to send the RFS request to On Line Center.

2.) Fill out the Last name, First name, and Phone number. Extension, Email, and Other system ID fields are optional.

3.) Select Problem Type.

If Problem is about “No Boot”, “No Image”, “Error message”, “Lock up”, “Probe”, “Peripherals”, select “**Service**” for the Problem Type.

If Problem is about “Presets”, “Reports”, “Measurements”, or “Probe not recognized”, select “**Applications**” for the Problem Type.

4.) Select the Problem Area.

5.) Write the detailed problem description in the Problem Description field.

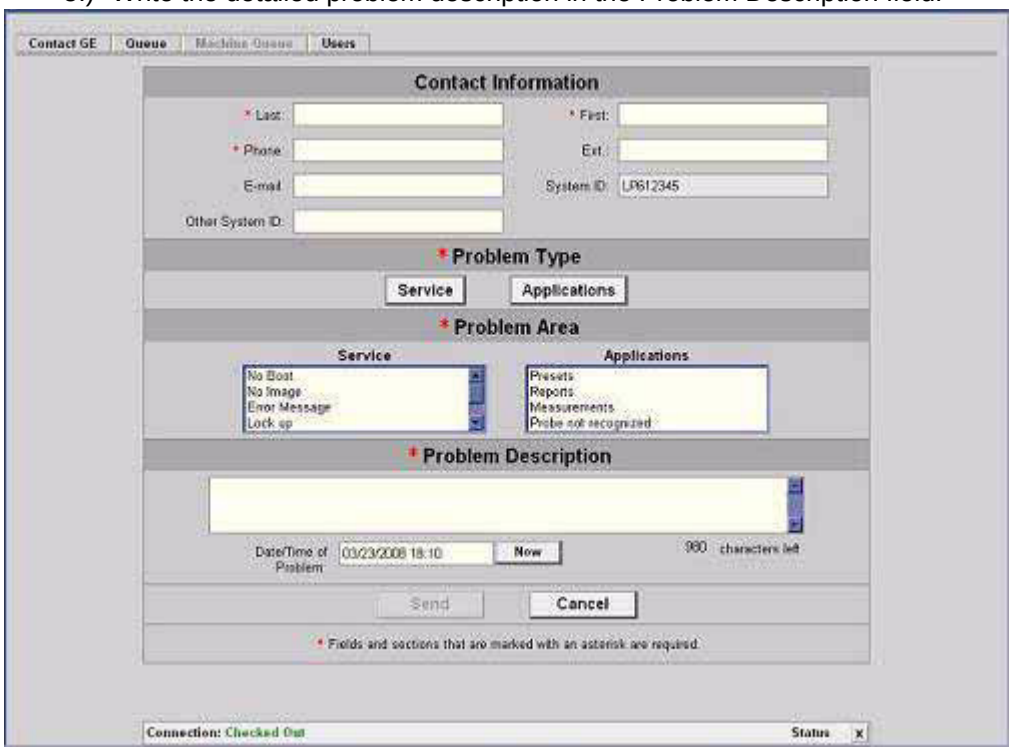


Figure 5-22 RFS Window

6.) Then the “Send” button is enabled.

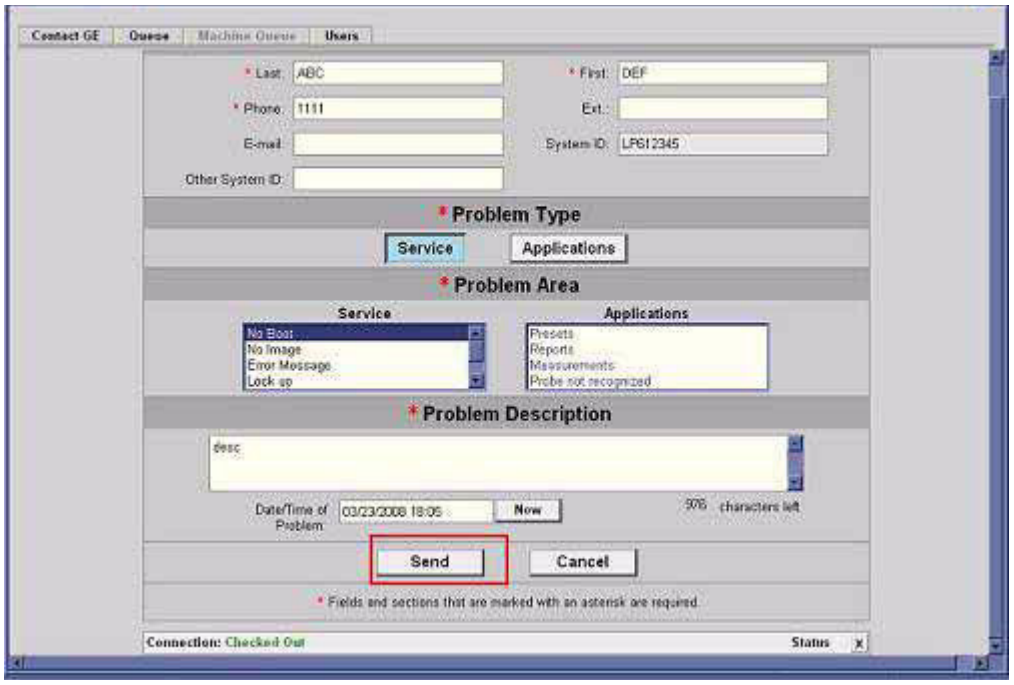


Figure 5-22 RFS Window

7.) Verify that "Send" button is enabled.

8.) Click “Send” button and wait for confirmation window with reference number on the screen.

9.) Verify that "confirmation message" pops up in the screen.

10.) RFS request is completed.

11.)On Line Center will contact the customer shortly by phone.

Section 5-6
Machine RFS

This describes general MRFS (Machine RFS) functionality.

MRFS function is an automatic call for service from the system to the OLC when system detects high temperature or high or low voltage.

5-6-1 Enabling MRFS

NOTE: *In order to enable MRFS, System must be connected to network and should be checked out to a product server. Default MRFS user should also be set.*

1.) If a system is not already checked out, the system should be checked out to a product server.
2.) MRFS function is an automatic call for service from the system to the OLC when system detects high temperature or high or low voltage.
3.) Right Click on “Connect to GE” icon.

Figure 5-23 Contact GE icon

4.) When the RFS window pops up, click on “Users” tab.

Figure 5-24 Users tab

5.) Press “Add User”.

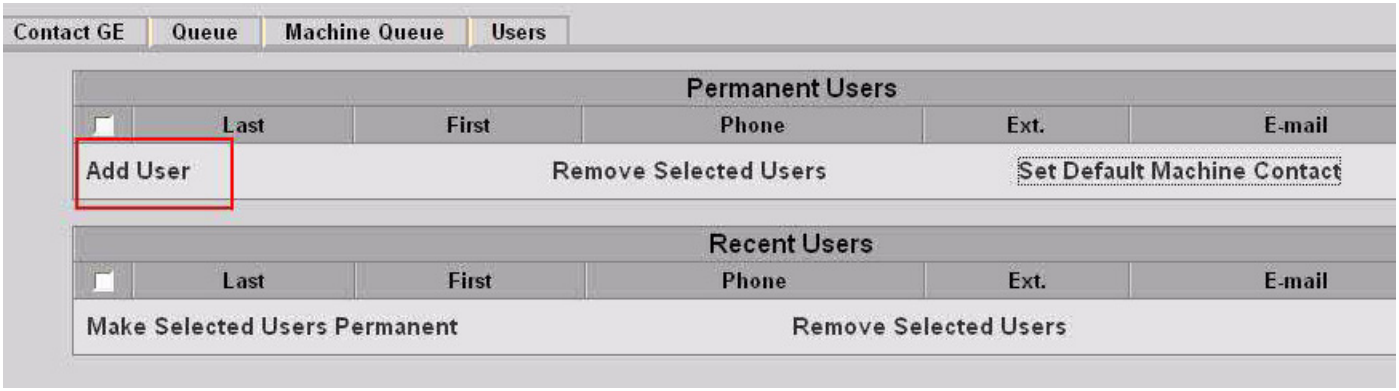


Figure 5-25 Add User

All the fields that are marked with asterisk * are mandatory and should be filled.

6.) When fields with asterisk are filled, “Add User” button is enabled.

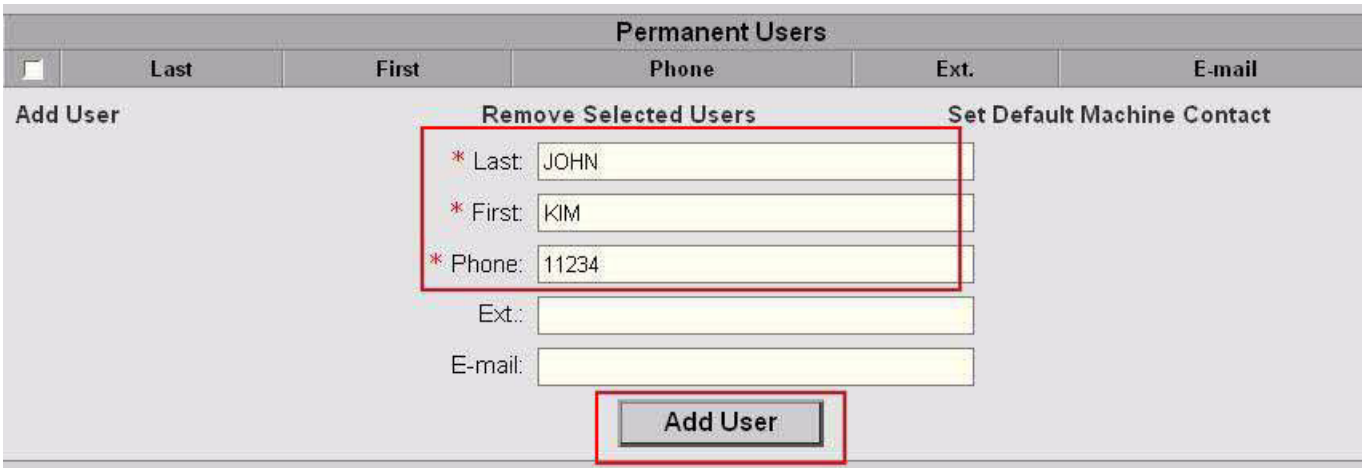


Figure 5-26 Add User

7.) Pess “Add User” button.

8.) Check the checkbox next to the name to set to the default contact. Then Press “Set Default Machine Contact” button.

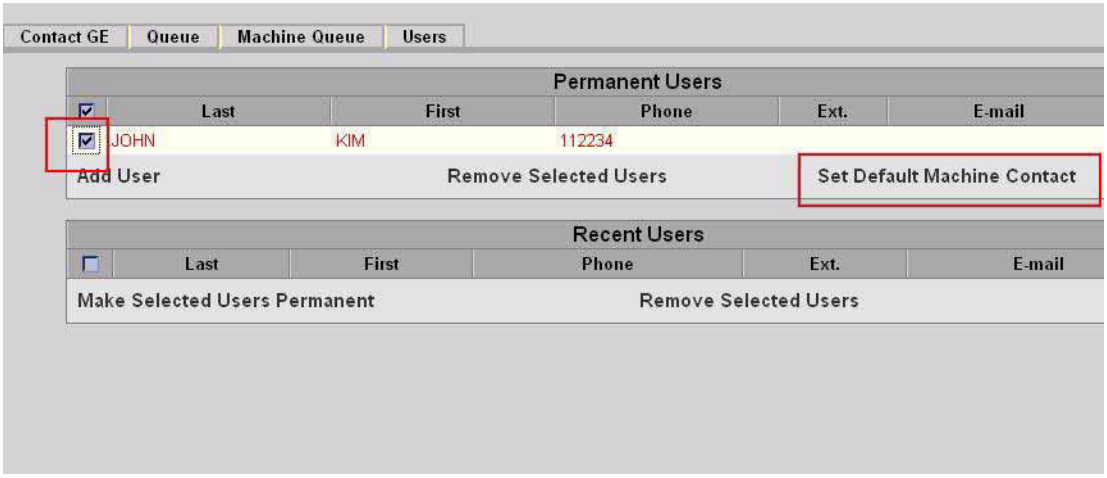


Figure 5-27 Set Default Machine Contact

9.) Now the MRFS is enabled.

10.) When system detects high temperature or abnormal voltage, it will send the RFS to the OLC automatically.

Chapter 6
Service Adjustments

Section 6-1
Overview

6-1-1 Purpose of this chapter 6

This section describes how to test and adjust the scanner. These tests are optional. You may use them to check the system for errors.

Table 6-1 Contents in chapter

Section	Description	Page Number
6-1	Overview	6-1
6-2	Monitor Adjustments	6-2

Section 6-2
Monitor Adjustments

6-2-1 Adjustments Procedures

To adjust the brightness:

1. Contrast Indicator
2. Brightness Indicator
3. Dim Brightness Indicator
4. Light Button
5. Adjustment (-) Button
6. Toggle Button
7. Adjustment (+) Button

NOTE: Default Factory setting for Contrast & Bightness is 80 and Dim brightness 50 as shown in Fig A.

Fig. A

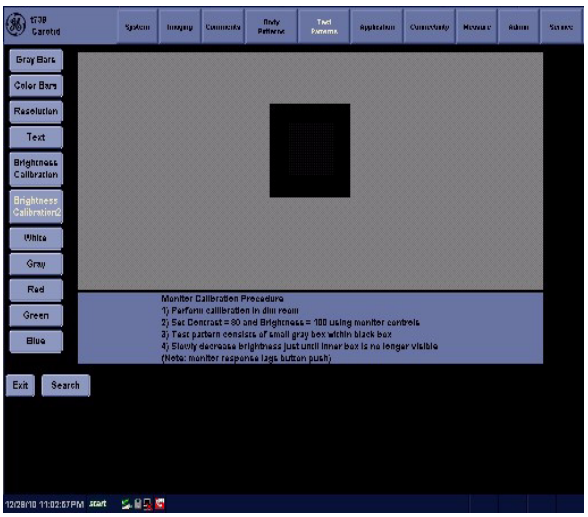


Fig. B

Figure 6-1 LCD Monitor

Dim brightness is the LCD lamp brightness control.

6-2-2 Monitor Calibration procedure.

1.Select Utility in A/N Keboard>Test patterns>Select the Brightness calibration and perform the monitor calibration procedure as displayed in the monitor as shown in Fig B.

Chapter 7
Diagnostics/Troubleshooting

Section 7-1
Overview

7-1-1 Purpose of Chapter 7

This section describes how to setup and run the tools and software that help maintain image quality and system operation. Very basic host, system and board level diagnostics are run whenever power is applied. Some Service Tools may be run at the application level. However most software tests are required.

Table 7-1 Contents in Chapter 7

Section	Description	Page Number
7-1	Overview	7-1
7-2	Gathering Trouble Data	7-2
7-3	USB Quick Save	7-4
7-4	Screen Captures	7-6
7-5	Wire - LAN Network	7-9
7-6	Troubleshooting	7-10

Section 7-2
Gathering Trouble Data

7-2-1 Overview

There may be a time when it would be advantageous to capture trouble images and system data (logs) for acquisition to be sent back to the manufacturer for analysis. There are different options to acquire this data that would give different results.

7-2-2 Collect Vital System Information

The following information is necessary in order to properly analyze data or images being reported as a malfunction or being returned to the manufacturer:

- Product Name = LOGIQ P3

From the *Utility>System>About* screen:

Applications Software

- Software Version
- Software Part Number

System Image Software

- Image Revision
- Image Part Number

7-2-3 Collect a Trouble Image with Logs

If the system should malfunction, press the Alt-D keys simultaneously. This will collect a screen capture of the image monitor, system presets and the following logs:

- Keyboard Shadow Log
- Error Logs
- Crash Log
- Power Supply
- Temperature

NOTE: Power Supply and Temperature logs are not currently being updated by the LOGIQ P3.

This Alt-D function is available at all times.

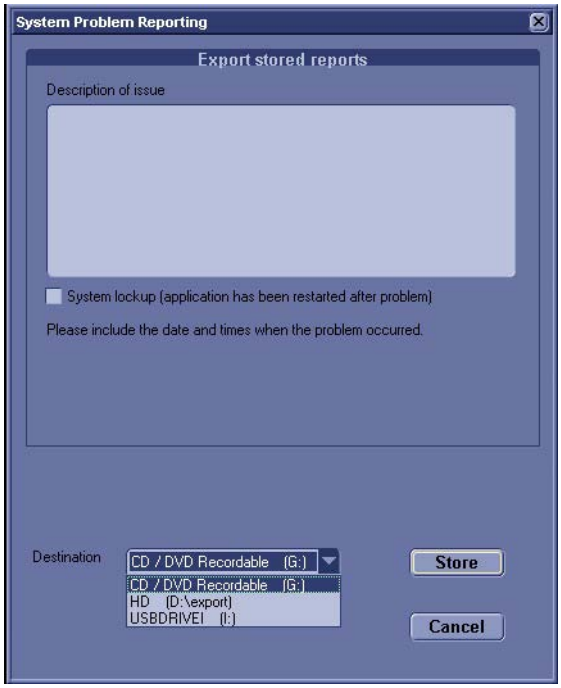


Figure 7-1 ALT+D Dialog Box

When Alt-D is pressed, a menu box appears that allows for:

- A place to enter a description of the problem
- A choice to store to a pre-formatted DVD-R, RD (Removable Disk) or to the *Export* directory D: export.

The subsequent file is compressed and time stamped. The screen capture is a bitmap which eliminates the possibility of artifacts from compression.

Section 7-3
USB Quick Save

7-3-1 Overview

There may be times when the customer or field engineer will want to directly save images into USB memory. This is accomplished by saving individual Cine clips (moving images- avi format) or still images (jpg format) directly to a USB memory disk by pressing a Print Key.

The P3 key is the factory default print key to accomplish the USB Quick Save. However, the default is for the Image Area only or the customer may have customized the P3 Key function.

7-3-2 Check and Record the P3 Key Function

Check the function of the Print 3 Key in the event that the customer may have made some customized settings.

1.) Click *Utility* on the keyboard.
2.) Select *Connectivity* from the Utilities Menu.
3.) Select the *Buttons* tab on the Connectivity screen.
4.) In the *Physical Print Buttons* field, select Print3.

The Connectivity/Buttons Screen will be displayed like the one shown in Figure 7-2 on page 7-4 .

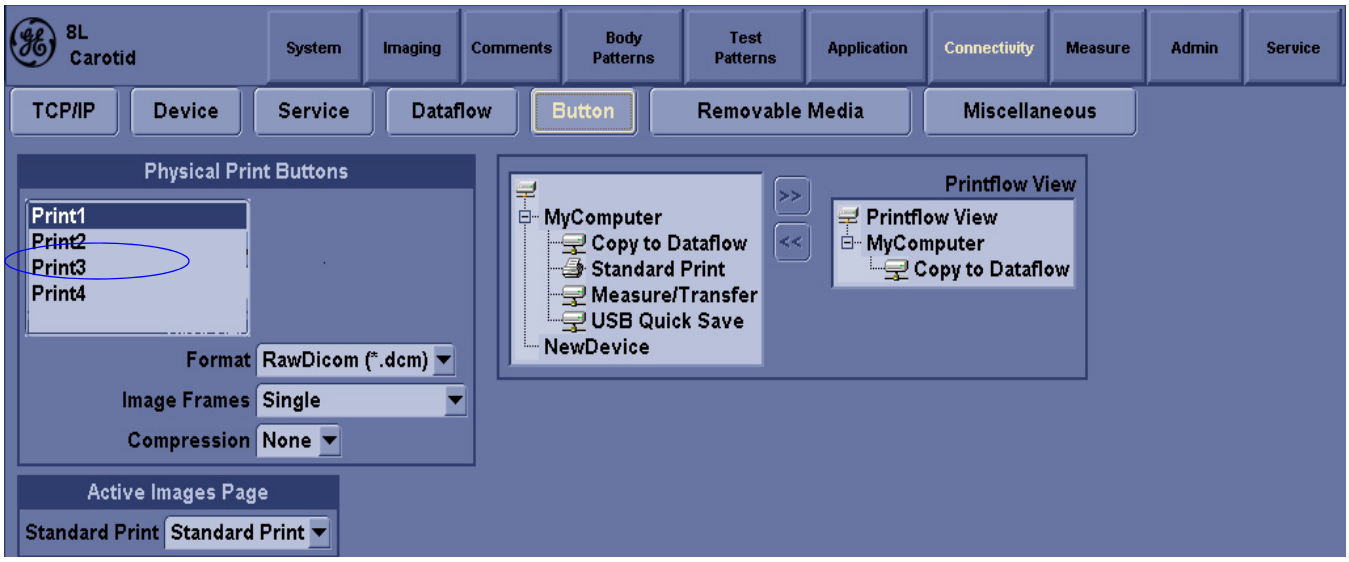


Figure 7-2 Buttons Set Up Screen

P3 is the factory default USB Quick Save key. If it is not set to Image Area, proceed to step 5 to record the customer's customized settings.

7-3-2 Check and Record the P3 Key Function (cont'd)

5.) In the Destinations section, record the service that is displayed.

6.) In the *Physical Print Buttons* section, record the parameters related to the service.

7-3-3 Setting the P3 Key to USB Quick Save

If the P3 Key is not set to USB Quick Save:

1.) While on the Connectivity screen, with the Buttons tab displayed, go to the *Destinations* list.

2.) From the list select *USB Quick Save*. Press [>>] to add the selection to the *Printflow View* section.

3.) Ensure that the *Physical Print Buttons* section for capture Area is set to Image Area and No Image Compression.

4.) The P3 Key should now be set up for USB Quick Save, sending the images directly to the USB memory.

NOTICE **It is unable to get full screen using USB Quick Save, just Image Area is available.**

Section 7-4
Screen Captures

There may be times when the customer or field engineer will want to capture a presentation on the screen. This is accomplished by first saving the image(s) to the clipboard using a Print Key.

There's no factory default print key to accomplish a secondary screen capture. However, customer may have customize any of Print Key function. Here, take Print3 button for example, Print1 and Print3 are the same. Therefore, screen capture should involve the following steps:

1.) Check and record any custom settings for the Print3 button.
2.) Set the Print3 button to Whole Screen, Secondary Capture.
3.) Capture the required screens to the Hard Drive or DVD-R.
4.) Restore the Print3 button to it's original settings.

7-4-1 Check and Record the P3 Key Function

Check the function of the Print3 Key in the event that the customer may have made some custom settings.

1.) Click *Utility* on the keyboard.
2.) Select *Connectivity* from the Utilities Menu.
3.) Select the *Buttons* tab on the Connectivity screen.
4.) In the *Physical Print Buttons* field, select Print3.

The Connectivity/Buttons Screen will be displayed like the one shown in Figure 7-2 on page 7-4 .

If P3 is not set to Whole Screen, as shown in Figure 7-2, proceed to step 5 to record the customer's customized settings.

5.) In the Destinations section, record the service that is displayed.
6.) In the *Physical Print Buttons* section, record the parameters related to the service.

7-4-2 Setting the P3 Key to Screen Capture

If the P3 Key is not set to screen capture:

1.) While on the Connect screen, with the Buttons tab displayed, go to the *Destinations* list.
2.) From the list select *Copy To Dataflow*. Press [>>] to add the selection to the *Printflow View* section.
3.) Ensure that the *Physical Print Buttons* section for capture Area is set to Whole Screen, secondary Capture and No Image Compression.
4.) The P3 Key should now be set up for whole screen capture, sending the screens to the image buffer (clipboard).

7-4-3 Capturing a Screen

The following is a generic process to capture any screen from the scanner:

1.) Navigate to and display the image/screen to be captured.
2.) Press **P3**. This will place a snapshot of the screen on the "clipboard" displayed at the bottom of the scan image display.

7-4-3 Capturing a Screen (cont'd)

Figure 7-3 Select Image to Capture

3.) Click FREEZE to unfreeze the image to view the image screen and the snapshots displayed on the bottom.

4.) Highlight the snapshot to be stored to RD (Removable Disk) or DVD-R.

5.) Select Menu on the right side of the image screen, then highlight and select SAVE AS.

Figure 7-4 Menu > Save As

7-4-3 Capturing a Screen (cont'd)

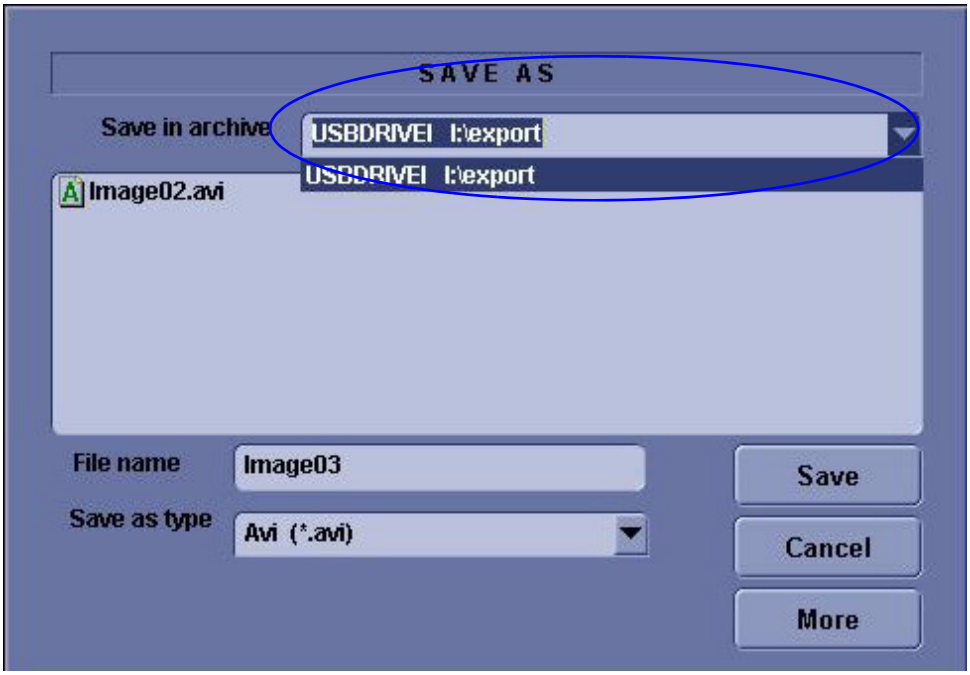


Figure 7-5 Save Dialog Box

6.) A Save dialog box will be opened. Choose *d:\export folder* as the archive location to save the image on the hard disk or DVD-R.

⚠ **NOTICE** **After capture the snapshot of the screen to the "clipboard" and save it to the hard disk or other media, it is not full screen image on the hard disk or media.**

7-4-4 Reset the P3 Key to Customer's Functionality

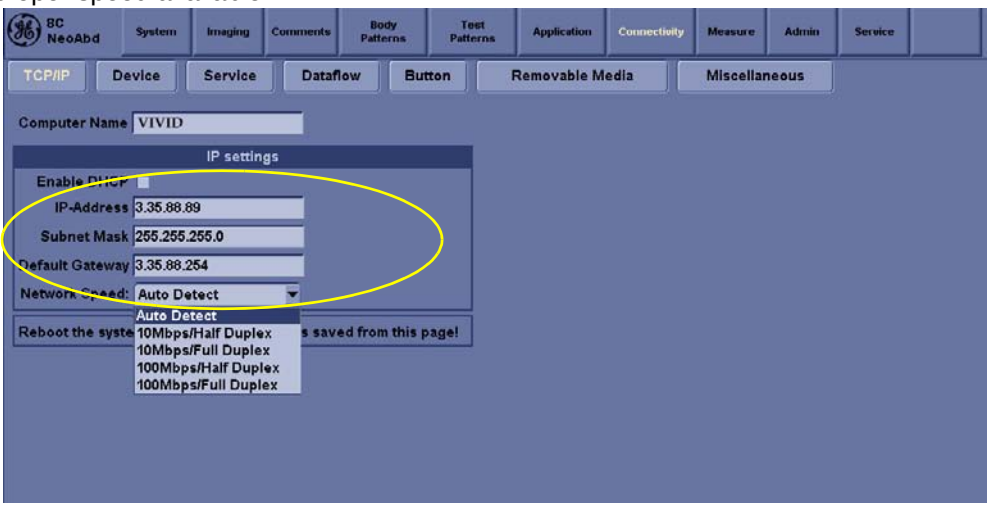
If the customer had programmed the P3 Key to a function other than screen capture, restore that functionality recorded in section 7-4-1 on page 7-6. Refer to Figure 7-2.

1.) Click *Utility* on the keyboard.
2.) Select *Connectivity* from the Utilities Menu.
3.) Select the *Buttons* tab on the Connectivity screen.
4.) In the *Physical Print Button* field, select Print3.
5.) In the *Destinations* list, select the service(s) recorded in step 5, Section 7-4-1.
6.) In the *Physical Print Buttons* section, select the parameters related to the service recorded in step 6, Section 7-4-1.

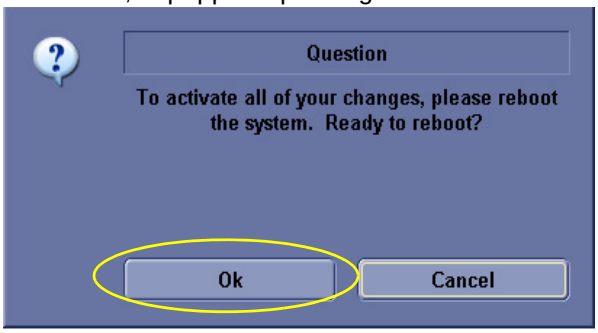
Figure 7-6

Section 7-5
Wire - LAN Network

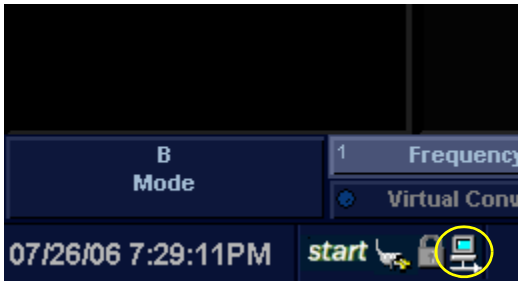
1.) If user wants to setup static IP address, uncheck Enable DHCP option, input static address in IP-Address box, Subnet Mask and Default Gateway box. In Network Speed box, choose the proper speed available.



2.) Click Save, in popped-up dialog and choose Ok.



3.) After reboot, the cross mark on the network icon at the left bottom of screen disappears.



Section 7-6
Troubleshooting

7-6-1 Console Troubleshooting Trees

7-6-1-1 System Doesn't Boot

This is an overall diagram showing a recommended sequence for troubleshooting a no-boot situation.

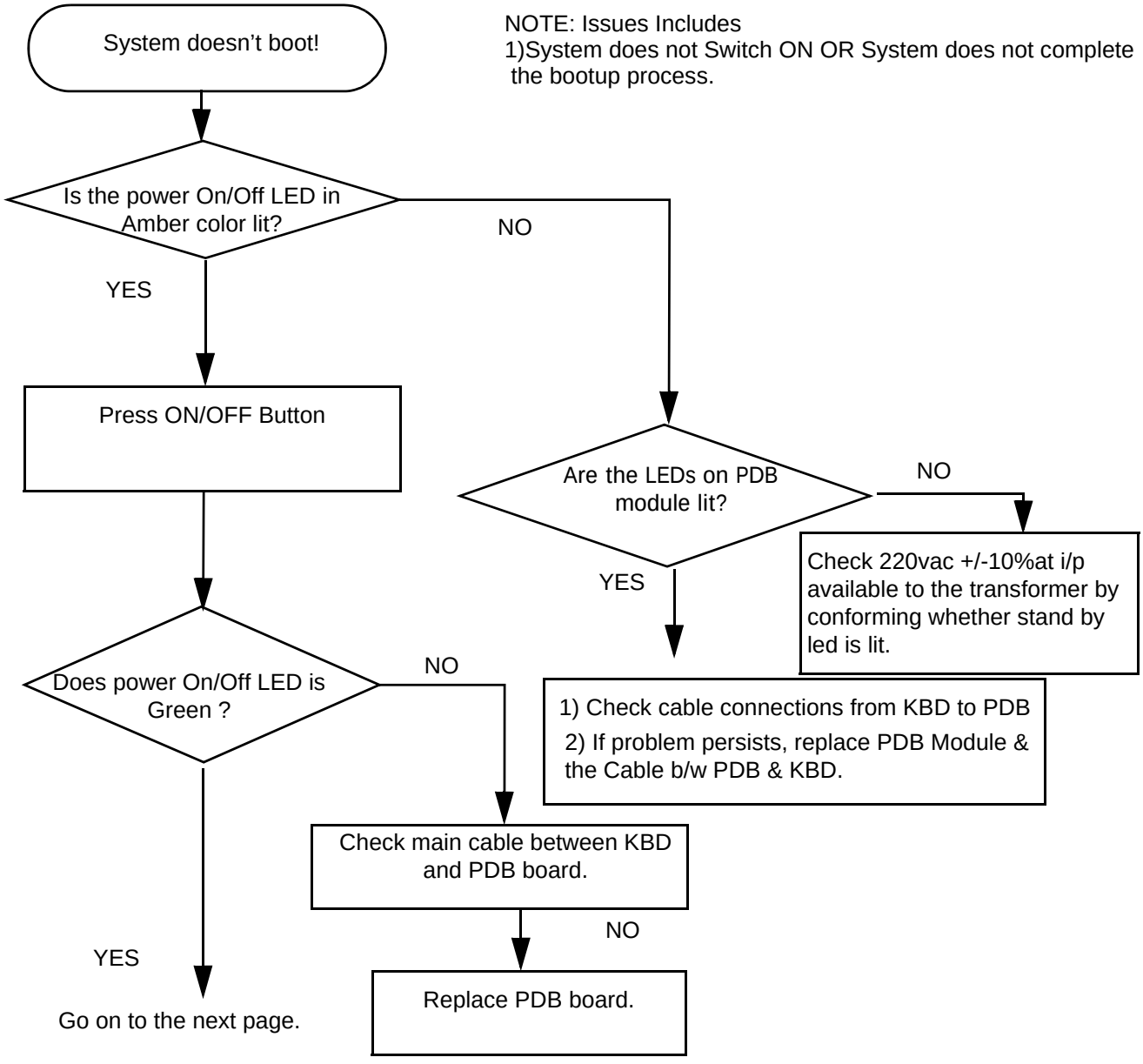

System doesn't boot!
NOTE: Issues Includes
1)System does not Switch ON OR System does not complete the bootup process.
Is the power On/Off LED in Amber color lit?
NO
YES
Press ON/OFF Button
Are the LEDs on PDB module lit?
NO
Check 220vac +/-10%at i/p available to the transformer by conforming whether stand by led is lit.
YES
Does power On/Off LED is Green ?
NO
1) Check cable connections from KBD to PDB
2) If problem persists, replace PDB Module & the Cable b/w PDB & KBD.
Check main cable between KBD and PDB board.
NO
YES
Replace PDB board.
Go on to the next page.

Figure 7-7 System Doesn't Boot (cont'd)

7-6-1-1 System Doesn't Boot (cont'd)

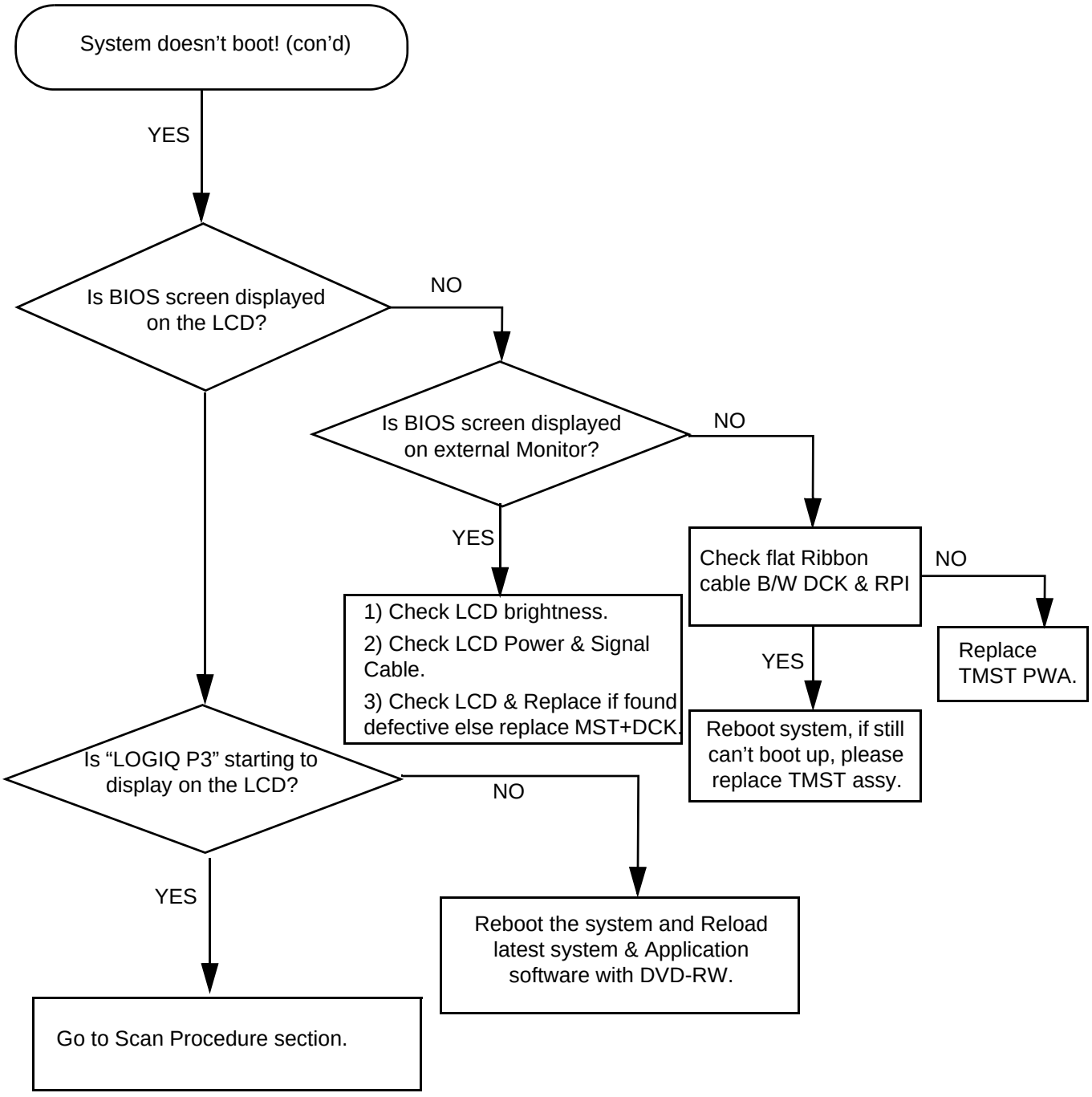

System doesn't boot! (con'd)
YES
Is BIOS screen displayed on the LCD?
NO
Is BIOS screen displayed on external Monitor?
NO
YES
Check flat Ribbon cable B/W DCK & RPI
NO
Replace TMST PWA.
YES
1) Check LCD brightness.
2) Check LCD Power & Signal Cable.
3) Check LCD & Replace if found defective else replace MST+DCK.
Reboot system, if still can't boot up, please replace TMST assy.
Is "LOGIQ P3" starting to display on the LCD?
NO
YES
Reboot the system and Reload latest system & Application software with DVD-RW.
Go to Scan Procedure section.

Figure 7-8 System Doesn't Boot (cont'd)

7-6-1-2 B Mode Low Sensitivity

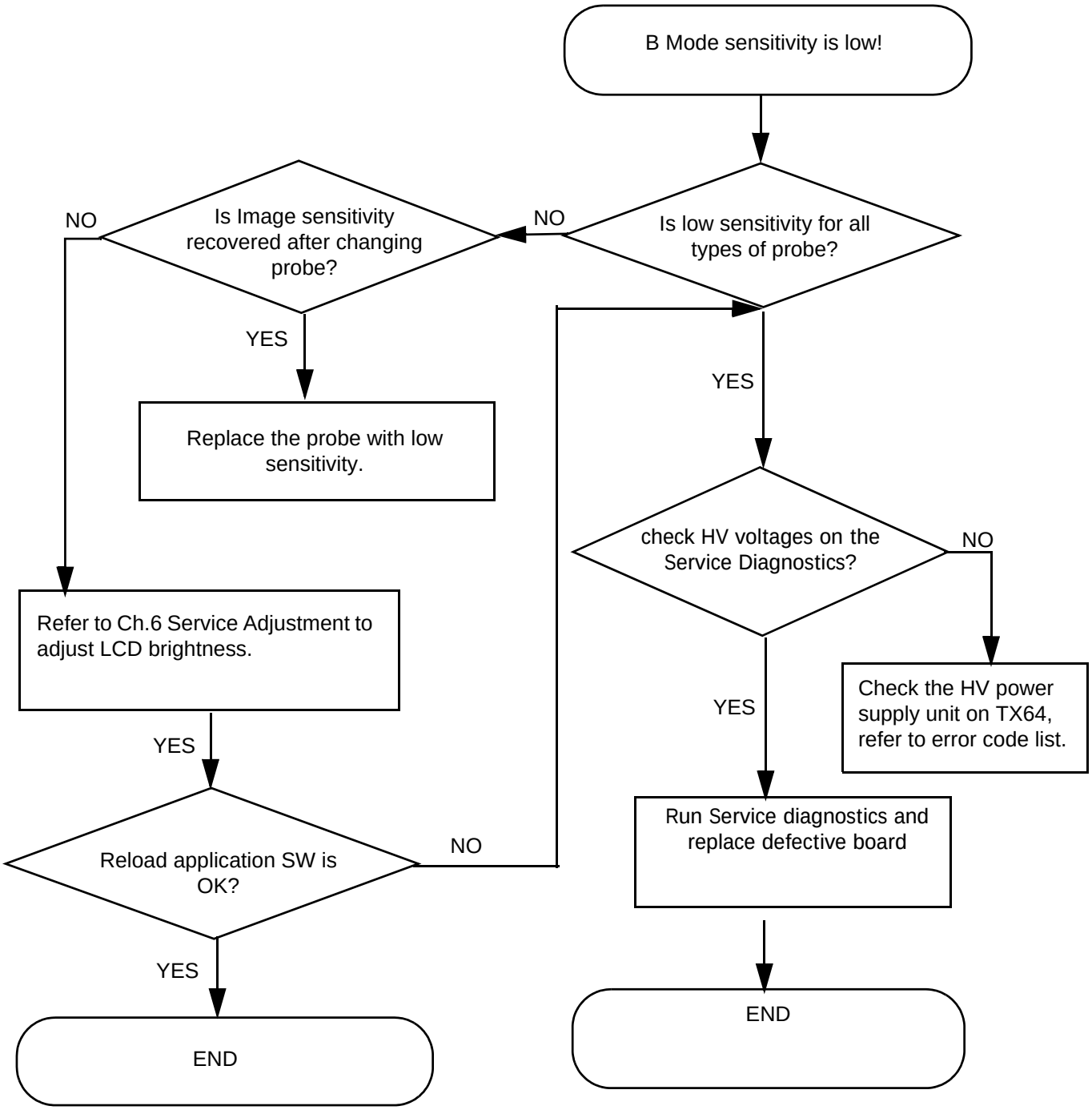


Figure 7-9 B Mode Low Sensitivity

7-6-1-3 B Mode Low Image Quality

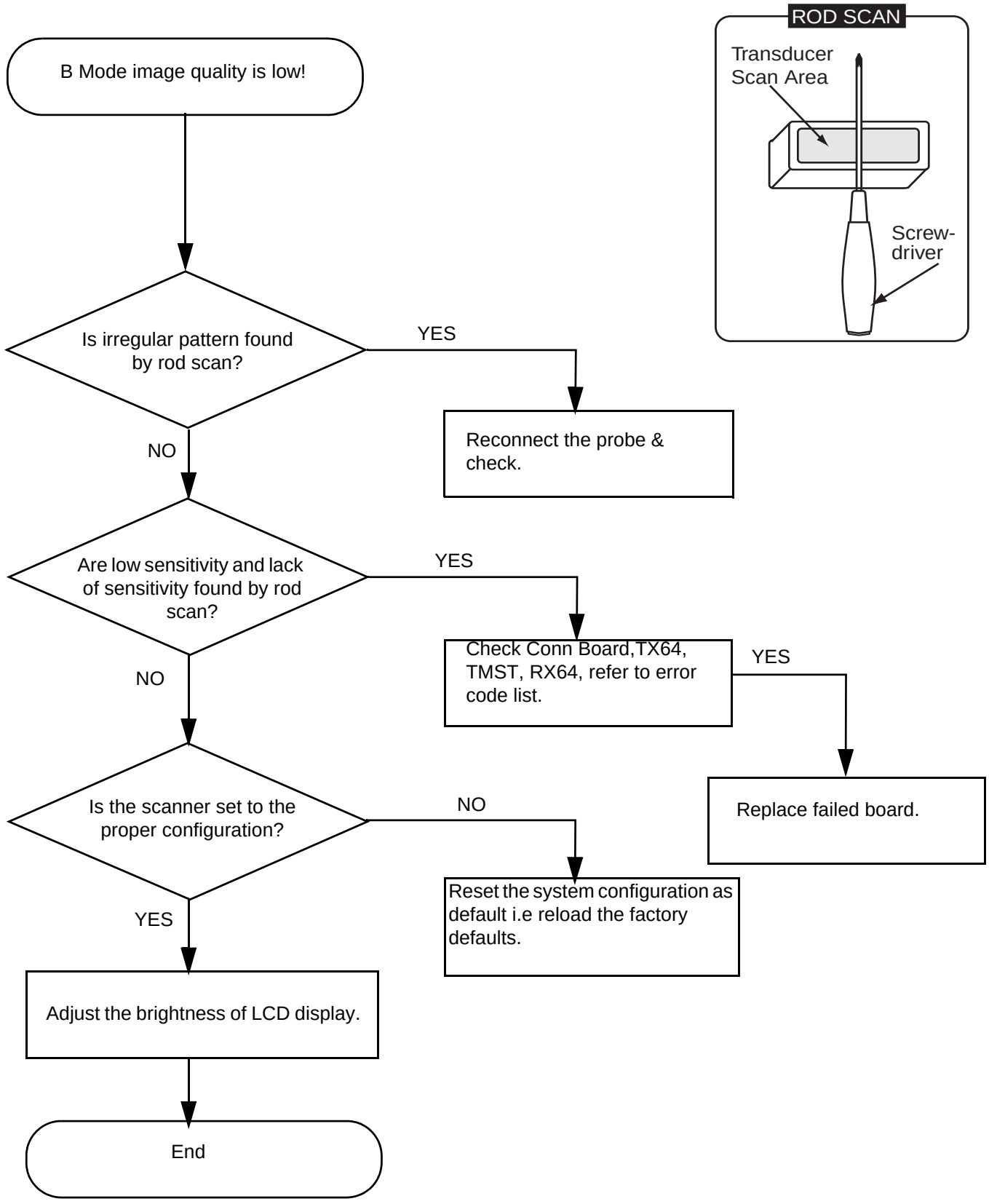

B Mode image quality is low!
Is irregular pattern found by rod scan?
YES
Reconnect the probe & check.
NO
Are low sensitivity and lack of sensitivity found by rod scan?
YES
Check Conn Board,TX64, TMST, RX64, refer to error code list.
YES
Replace failed board.
NO
Is the scanner set to the proper configuration?
NO
Reset the system configuration as default i.e reload the factory defaults.
YES
Adjust the brightness of LCD display.
End
ROD SCAN
Transducer Scan Area
Screw-driver

Figure 7-10 B Mode Low Image Quality

7-6-1-4 Noise in B Mode

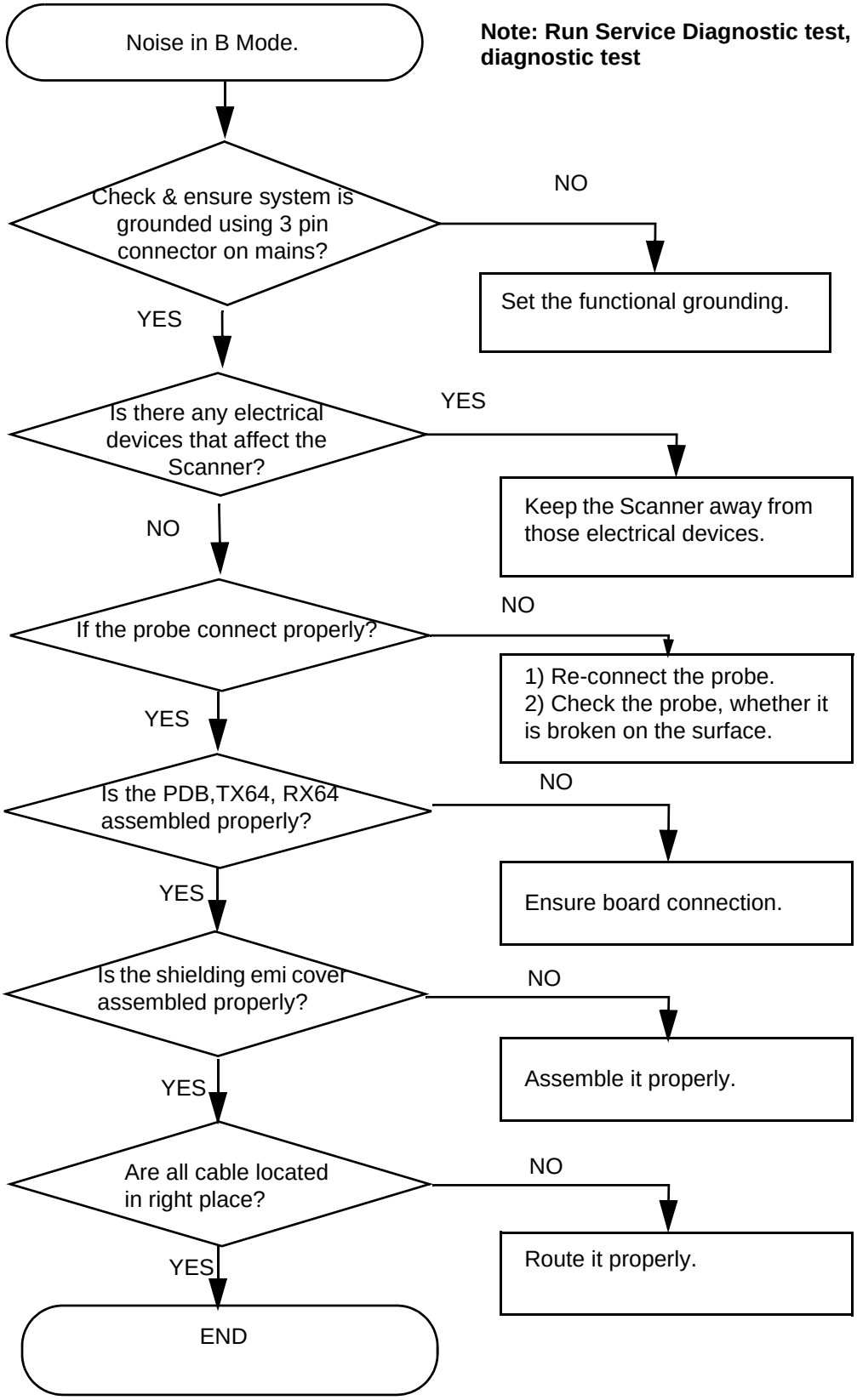


Figure 7-11 Noise in B Mode

7-6-1-5 Color Flow Low Sensitivity

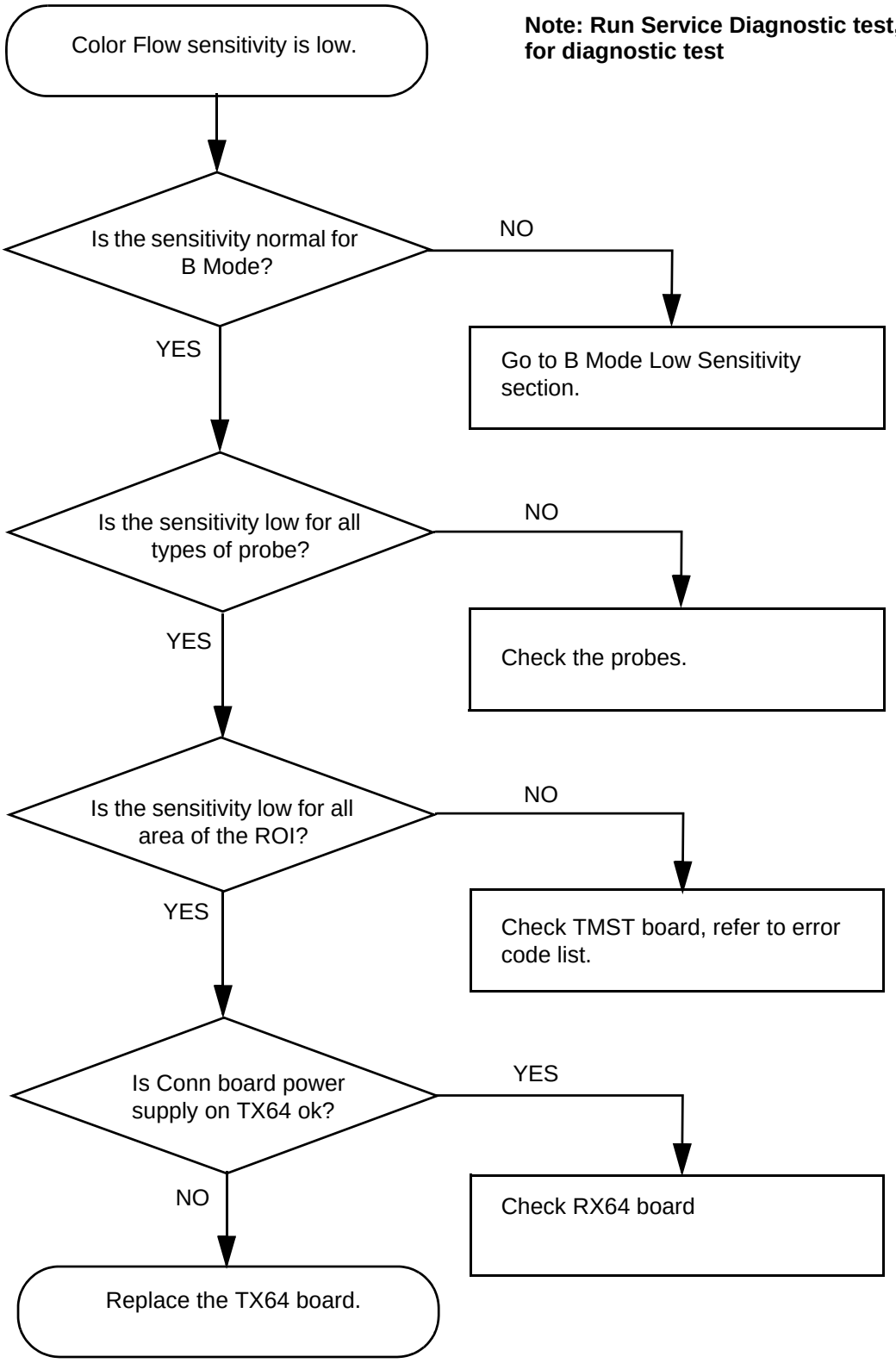

Color Flow sensitivity is low.
Note: Run Service Diagnostic test, Refer sec 7-7 for diagnostic test
Is the sensitivity normal for B Mode?
NO
YES
Go to B Mode Low Sensitivity section.
Is the sensitivity low for all types of probe?
NO
YES
Check the probes.
Is the sensitivity low for all area of the ROI?
NO
YES
Check TMST board, refer to error code list.
Is Conn board power supply on TX64 ok?
YES
NO
Check RX64 board
Replace the TX64 board.

Figure 7-12 Color Flow Low Sensitivity

7-6-1-6 Spectrum Doppler Low Sensitivity

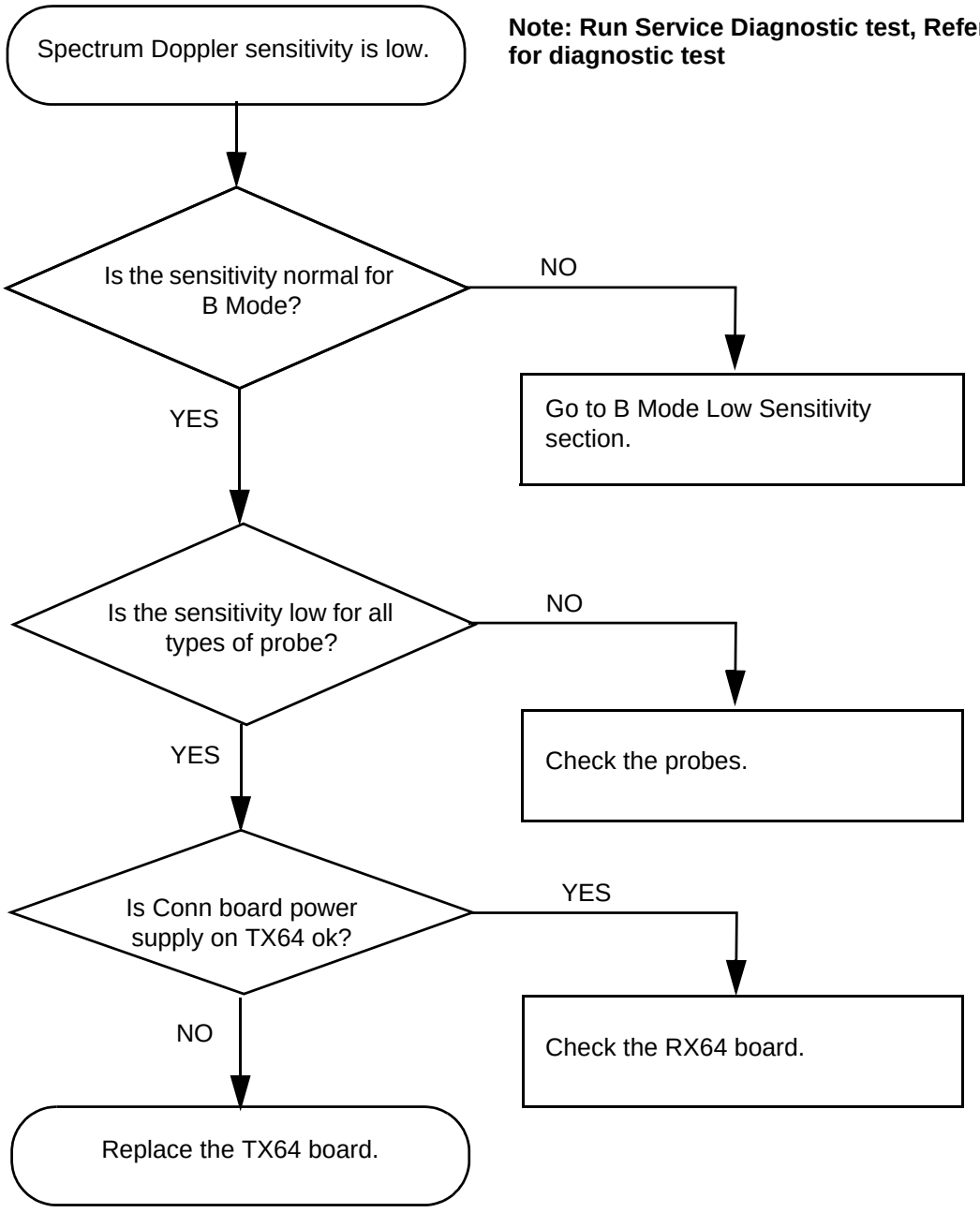

Spectrum Doppler sensitivity is low.
Note: Run Service Diagnostic test, Refer sec 7-7 for diagnostic test
Is the sensitivity normal for B Mode?
NO
Go to B Mode Low Sensitivity section.
YES
Is the sensitivity low for all types of probe?
NO
Check the probes.
YES
Is Conn board power supply on TX64 ok?
YES
Check the RX64 board.
NO
Replace the TX64 board.

Figure 7-13 Spectrum Doppler Low Sensitivity

7-6-1-7 Noise in Color Flow

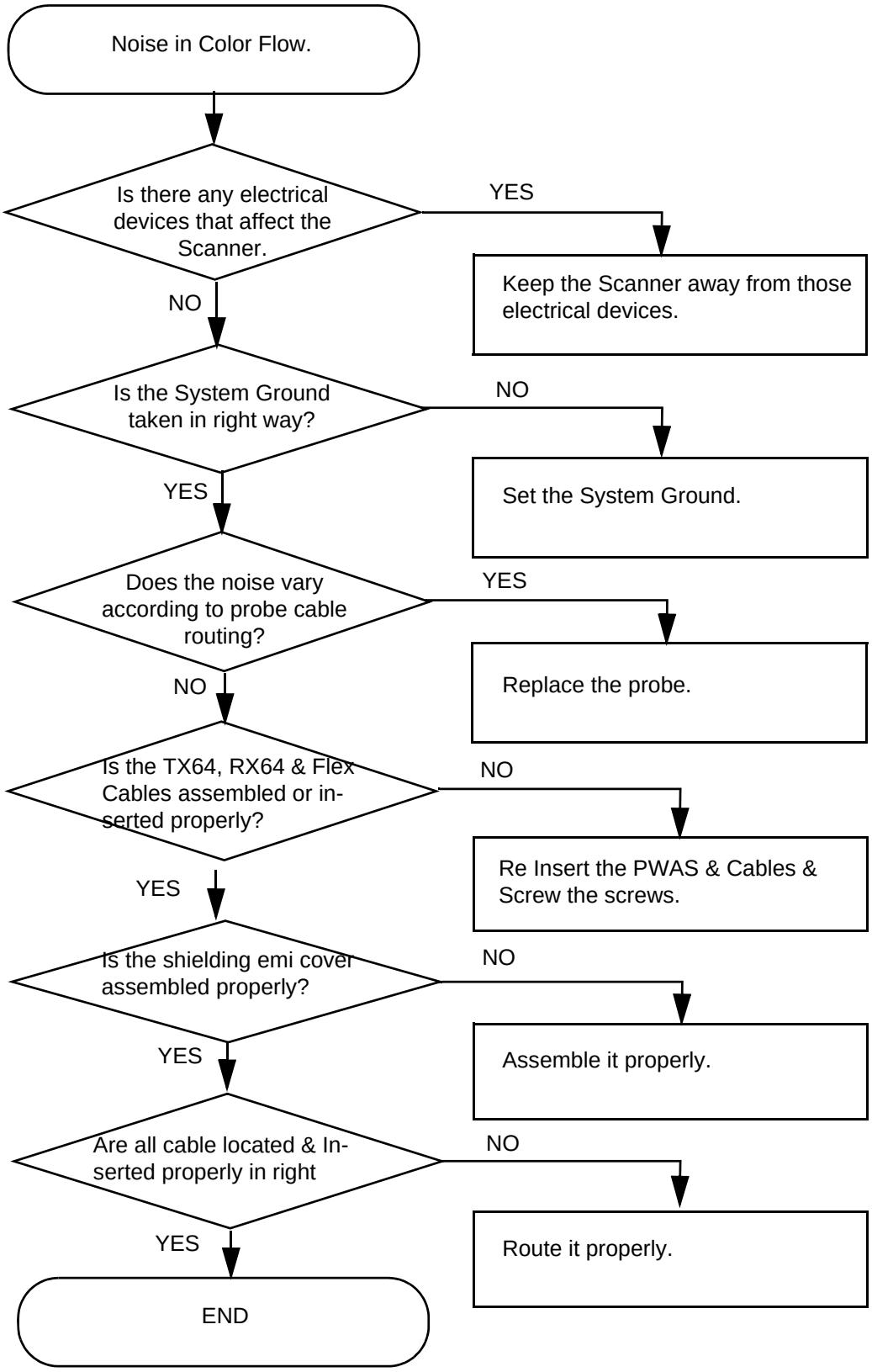


Figure 7-14 Noise in Color Flow

7-6-1-8 Scan Procedure

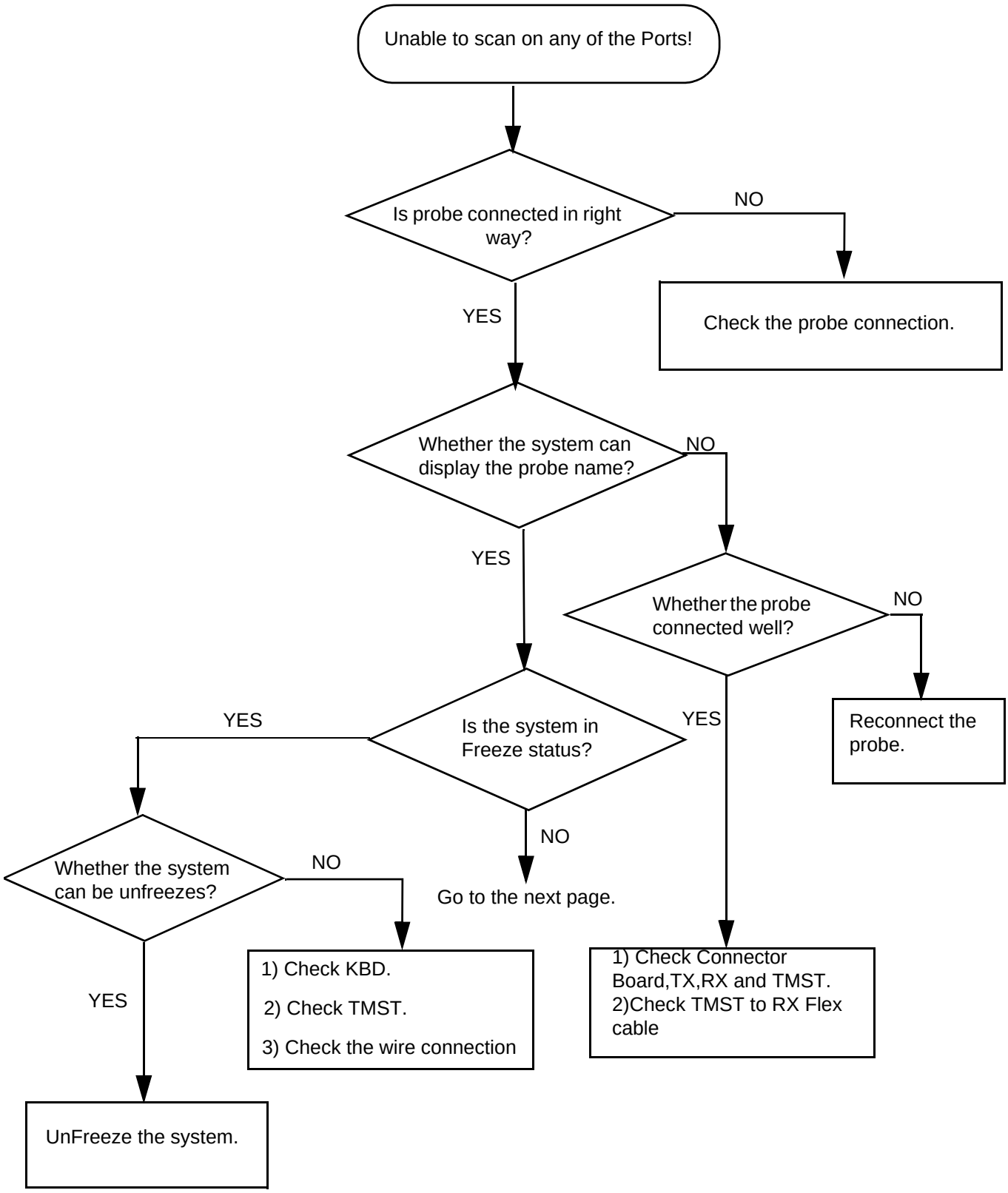


Figure 7-15 Unable to Scan

7-6-1-8 Scan Procedure (cont'd)

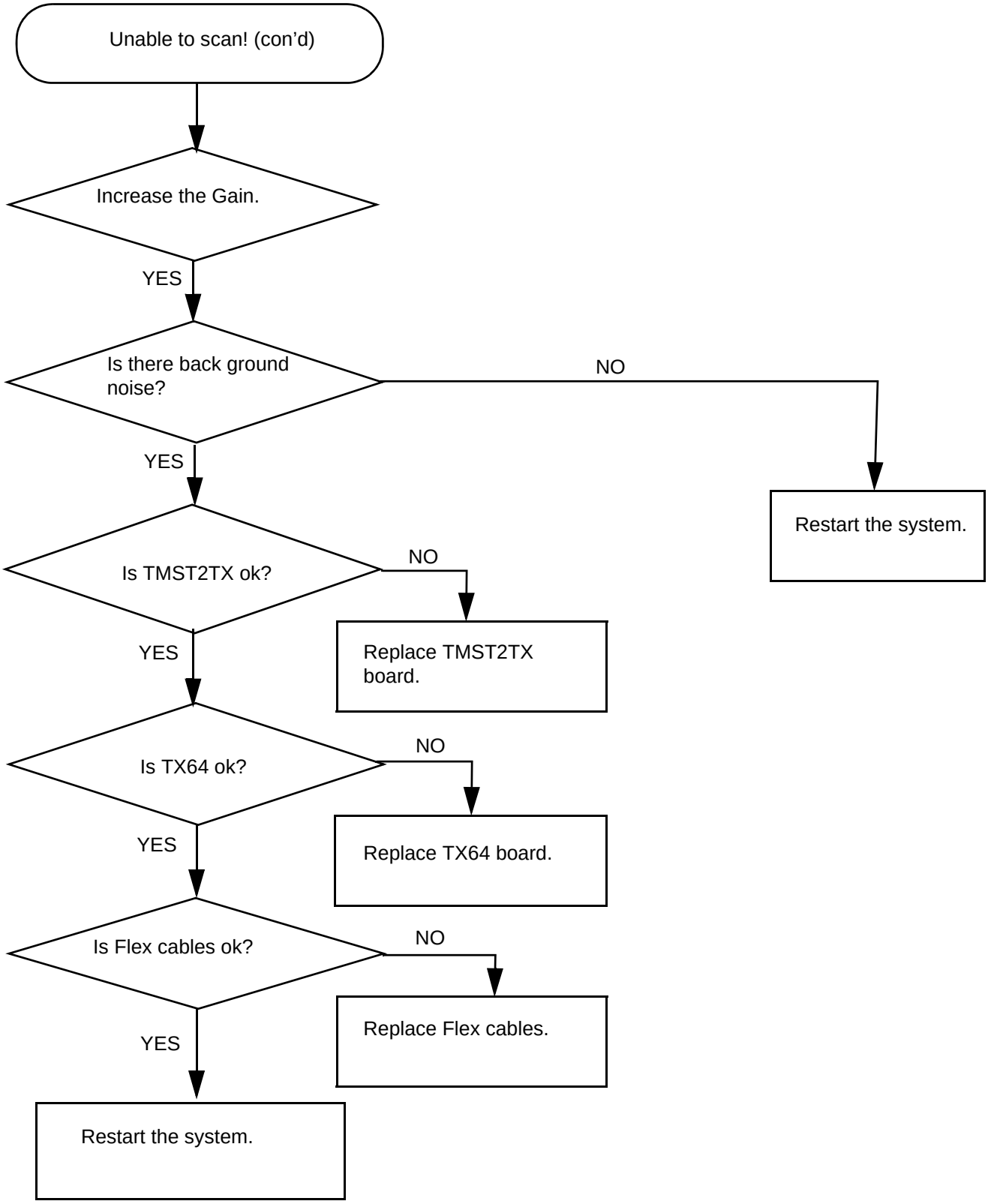


Figure 7-16 Unable to scan (con'd)

7-6-1-9 Trackball

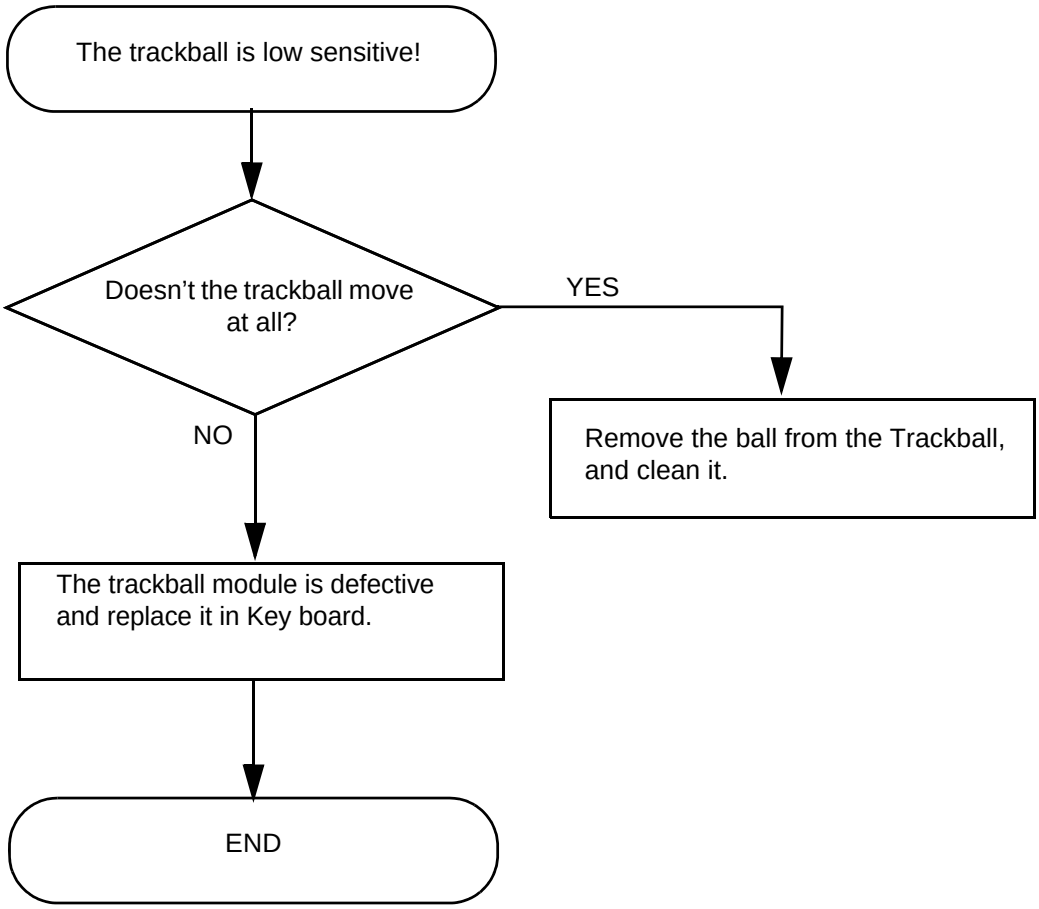

The trackball is low sensitive!
Doesn't the trackball move at all?
YES
NO
Remove the ball from the Trackball, and clean it.
The trackball module is defective and replace it in Key board.
END

Figure 7-17 Trackball

7-6-1-10 LCD Display

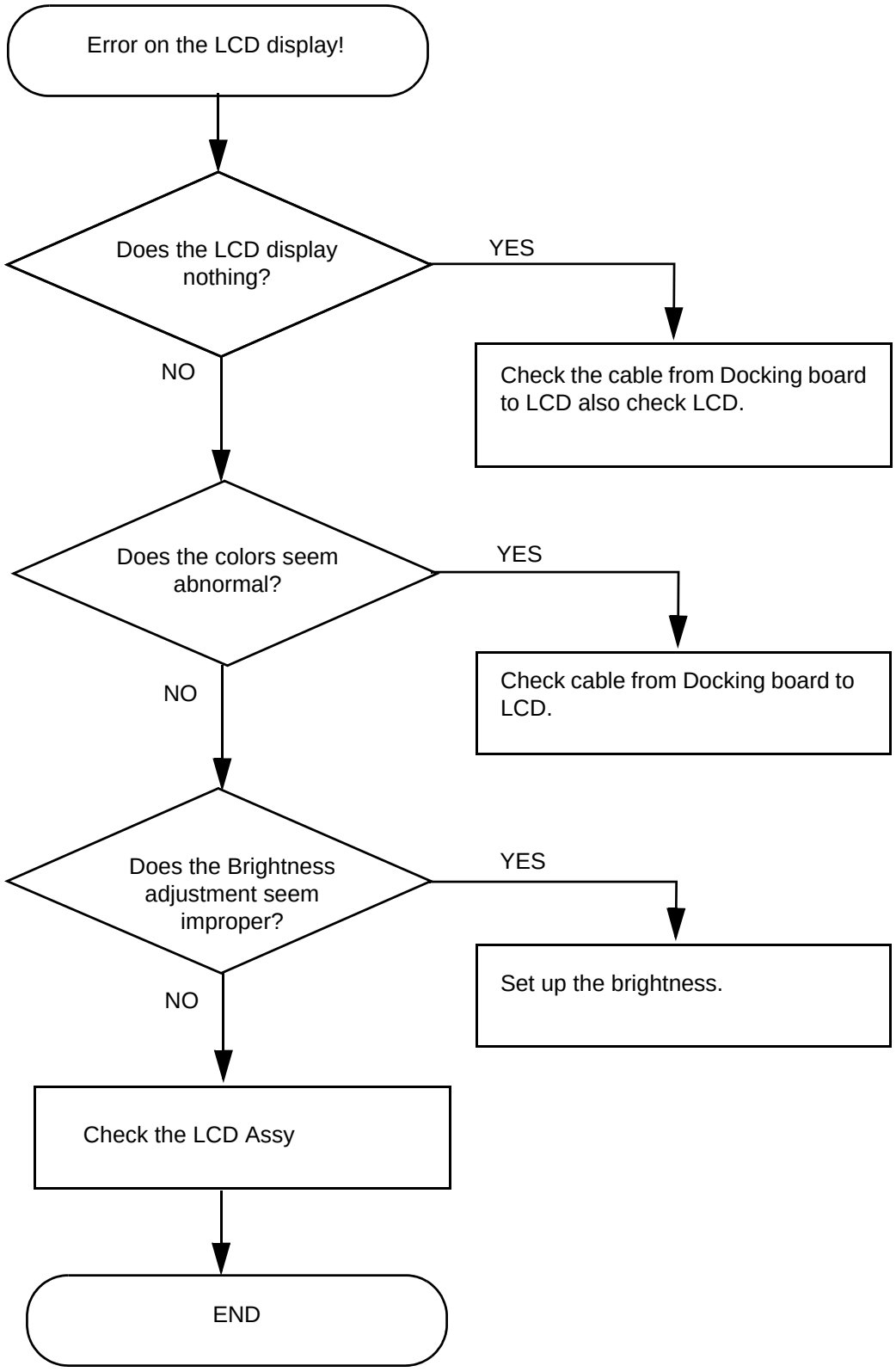


Figure 7-18 LCD Display

7-6-2 Peripheral Troubleshooting Trees

7-6-2-1 Unable Recording by Printer

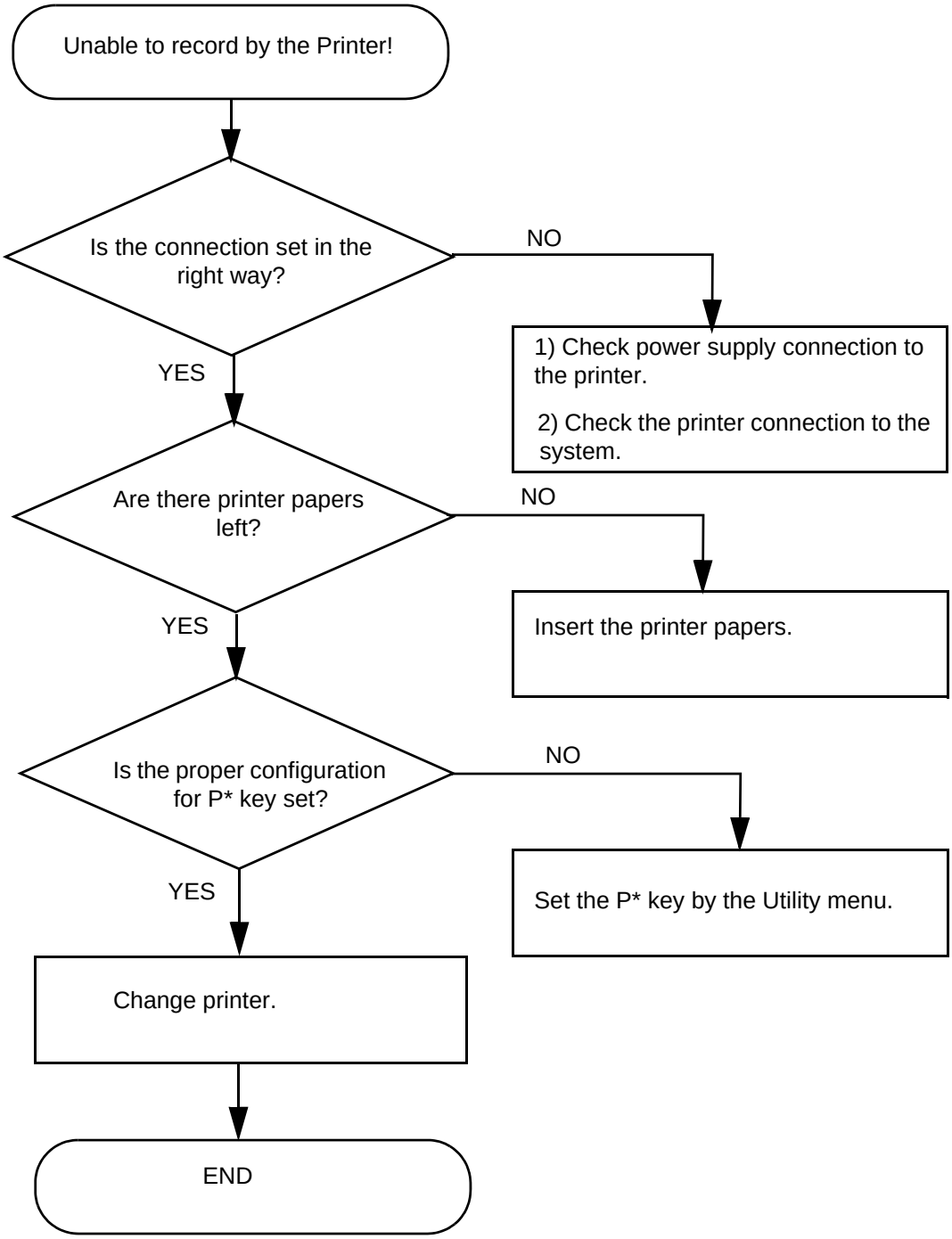

Unable to record by the Printer!
Is the connection set in the right way?
NO
1) Check power supply connection to the printer.
2) Check the printer connection to the system.
YES
Are there printer papers left?
NO
Insert the printer papers.
YES
Is the proper configuration for P* key set?
NO
Set the P* key by the Utility menu.
YES
Change printer.
END

Figure 7-19 Unable Recording by Printer

7-6-2-2 Drive Issue DVD-RW

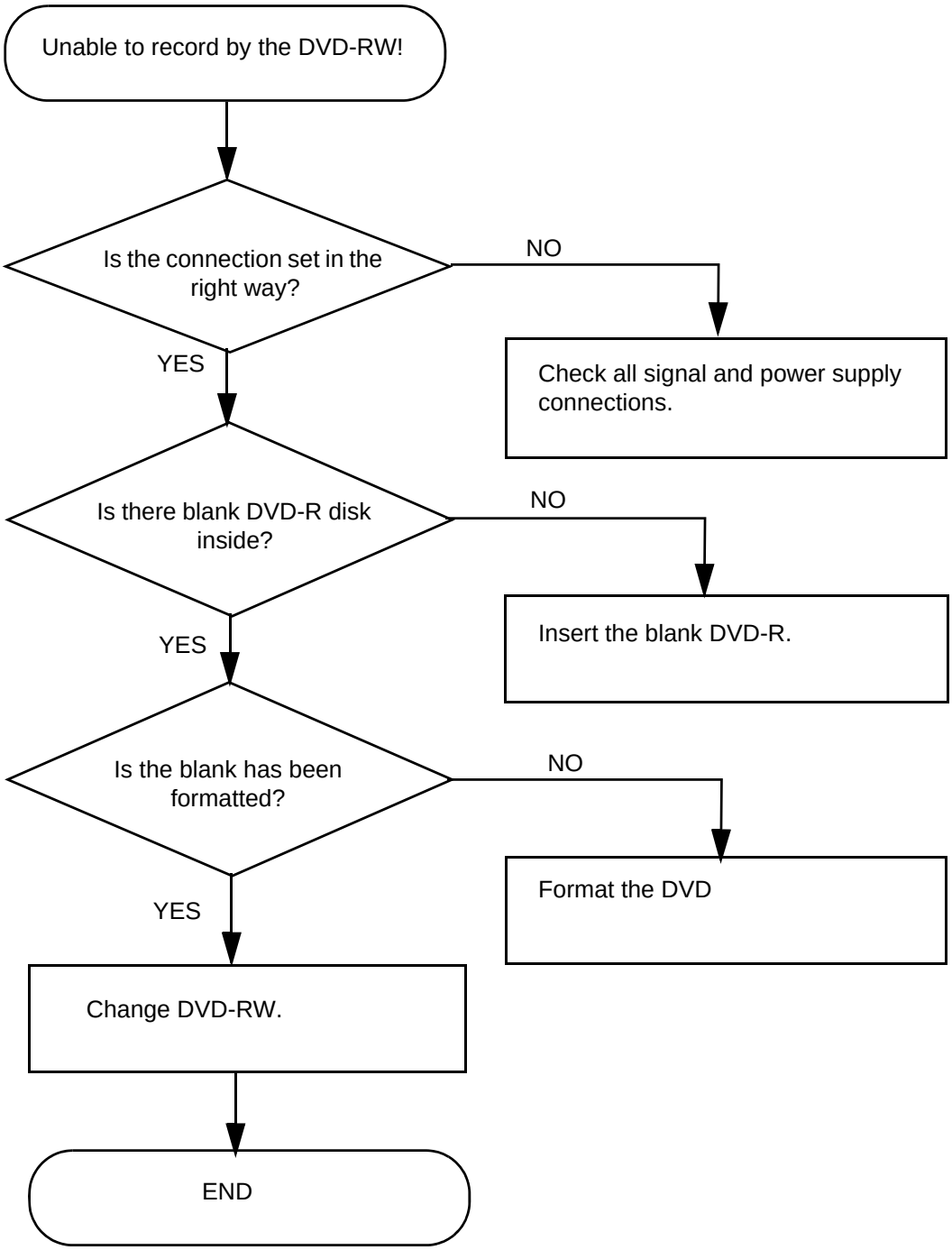


Figure 7-20 Unable Recording by DVD-RW

7-6-3 LCD Troubleshooting

LCD does not work

- Check if LCD is getting power.
- Check if LCD Video signal cable is connected properly on either end.

Colored stains appear in image

- Check for Video cable of LCD.
- Change LCD setting in system.
- Replace the LCD.

7-6-4 Network Troubleshooting Trees

7-6-4-1 No Connection to the Network at All

1.) Check if the LCD indicates the network connection is working in normal status.
Click Start button on the bottom left of the status bar, select Network Connections. (refer to 7-69)

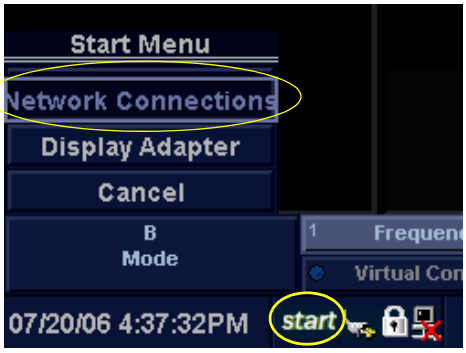


Figure 7-21 Start menu

a.) Check whether your Wireless Network Connection or Local Area Connection is installed successfully. (refer to Figure 7-70)

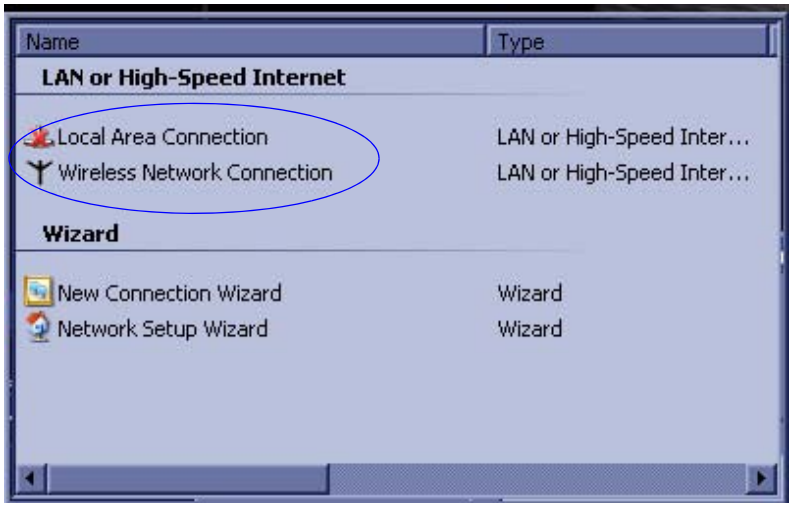


Figure 7-22 Network Connection

7-6-4-1 No Connection to the Network at All (cont'd)

2.) Check that the network cable between the scanner and the wall network is connected and well seated in both ends.

3.) Try a network cable that is known to be OK.

4.) Connect a network cable between the Scanner and your PC. Try to ping from the scanner to the IP address on the PC. If ok, the hardware connection inside the scanner is OK.

Chapter 8
Replacement Procedures

Section 8-1
Overview

8-1-1 Purpose of Chapter 8

This chapter describes replacement procedures for the following modules and subsystems.

Table 8-1 Contents in Chapter 8

Section	Description	Page Number
8-1	Overview	8-1
8-2	Disassembly/Re-assembly of LOGIQ P3	8-2
8-2-1	Warning and Caution	8-2
8-2-2	Returning/Shipping for repairs	8-2
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8-2-4	LCD Assy (FRU P/N: 5315112-LP3, 5396925-LP3 BT10)	8-4
8-2-5	LCD Arm Cover (FRU P/N: 5310093)	8-8
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Table 8-1 Contents in Chapter 8

Section	Description	Page Number
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Section 8-2 Disassembly/Re-assembly of LOGIQ P3

8-2-1 Warning and Caution

WARNING ***ONLY QUALIFIED SERVICE PERSONNEL SHOULD REMOVE ANY COVERS OR PANELS. ELECTRICAL HAZARDS EXISTS AT SEVERAL POINTS INSIDE. BECOME THOROUGHLY FAMILIAR WITH ALL HAZARDOUS VOLTAGES AND HIGH CURRENT LEVELS TO AVOID ACCIDENTAL CONTACT***

CAUTION **Do not wear the ESD wrist strap when you remove a part of power supply unit. Turn OFF power and unplug the power cord before removing a part of power supply unit.**

8-2-2 Returning/Shipping for repairs

Equipment being returned must be clean, free of blood and other infectious substances.

GEHC policy states that body fluids must be properly removed from every part or equipment prior to shipment. GEHC employees, as well as customers, are responsible for ensuring that parts/equipment have been decontaminated prior to shipment. Under no circumstances should a part or equipment with visible fluids be taken or shipped from a clinic or site (For example: body coils or an ultrasound probe). The purpose of the regulation is to protect employees in the transportation industry, as well as the people who receives or opens the package.

NOTE: The US Department of Transportation (DOT) has ruled that "items that were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended to use in patient care" are "regulated medical waste" for transportation purposes and must be transported as a hazardous material.

8-2-3 Standard tools list for LOGIQ P3

Table 8-2 Standard tools list

No	Part Name	Screw Description	Screwdriver Description
1	screw	Screwdriver, Stubby	Phillips #2
2	screw	1/4 in. Standard.Socket set (19 pc)	Xcelite-hex Blade 5/32 inch
3	screw	Screwdriver, Slotted 1/4 in.X 6 in.	Steel rule Metric 6 inch
4	screw	Screw FH M2.5x3 (NL)	Phillips #1
5	screw	Screw SFH M2.5x4 (NL)	Phillips #1
6	screw	Screw FH M2.5x5 (NL)	Phillips #1
7	screw	Screw FHE M2.5x5 (NL)	Phillips #1
8	screw	Screw SJ2836-87 M2.5X6 (I)	Phillips #1
9	screw	SCREW SJ2836-87 M2.5x12 (II)	Phillips #1
10	screw	D2 SCREW M3X3-NYLOK	Phillips #1
11	screw	Screw FH M3X6 (NL)	Phillips #1
12	screw	D2 SCREW SJ2836-87 M3X8	Phillips #2
13	screw	Screw BN5687 M3X10 (NL)	TORX#10
14	screw	Screw FH M3X13 (NL)	Phillips #1
15	screw	Screw SJ2836-87 M3X18 (I)	Phillips #2
16	screw	Screw M3x25 (NL)	TORX#10
17	screw	Screw M4x12	TORX#10

NOTE: Please use the correct Screwdrivers listed in Table 8-2 on LOGIQ P3.

NOTE: After Replacement of the Hardware Boards on LOGIQ P3BT10, please perform Shutdown and Reboot.

8-2-4 LCD Assy (FRU P/N: 5315112-LP3, 5396925-LP3 BT10)

Purpose: This is a description on how to remove and replace the LCD Assy.

8-2-4-1 Tools

- Common phillips screwdrivers
- Allen/Unbraco wrench

8-2-4-2 Needed Manpower

- 1 person, 11 minutes + travel

8-2-4-3 Preparations

- Shut Down the System Switch of the circuit breaker at the bottom rear side of the system.

8-2-4-4 Removal procedure

1) Shut down the Logiq P3 system.

2) LCD monitor rearcover of Logiq P3 system.as shown below Figure 8-1 on page 8-4

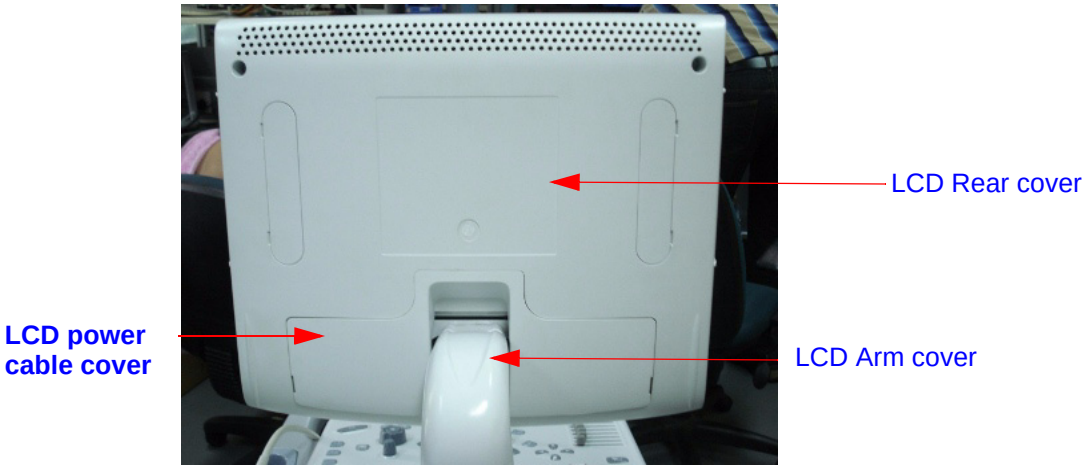


Figure 8-1 LCD rear cover

3) Bend down the LCD monitor by 90 degree.

4) Bend the LCD monitor as shown below Figure 8-2 on page 8-5

8-2-4 LCD Assy (FRU P/N: 5315112-LP3, 5396925-LP3 BT10) (cont'd)

5) Use minus screw driver and remove the power cable cover. Refer Figure 8-2 on page 8-5

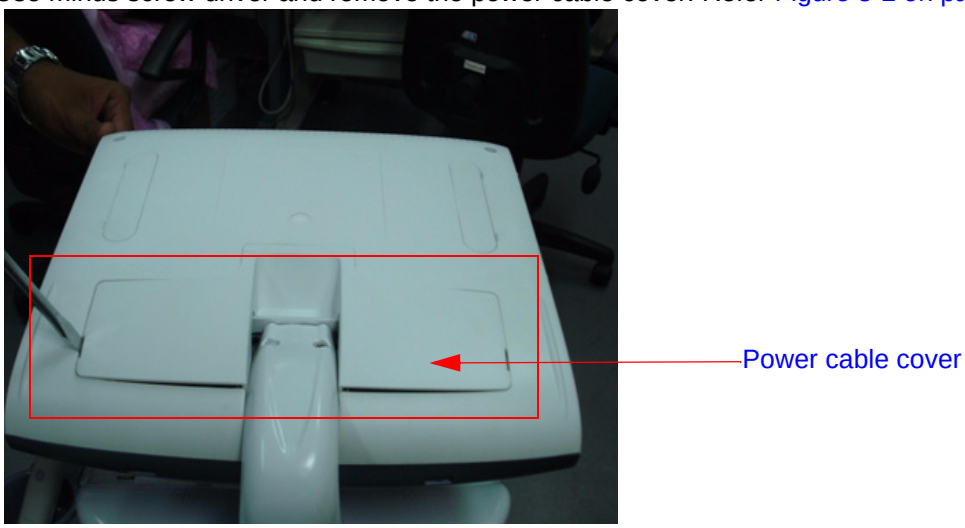


Figure 8-2 Power cable cover

6) Remove the Power cable cover of LCD monitor as shown below Figure 8-3 on page 8-5

7) unfasten the cable clamp for power cable and DVI cables and conncted to the LCD monitor

Refer Figure 8-3 on page 8-5

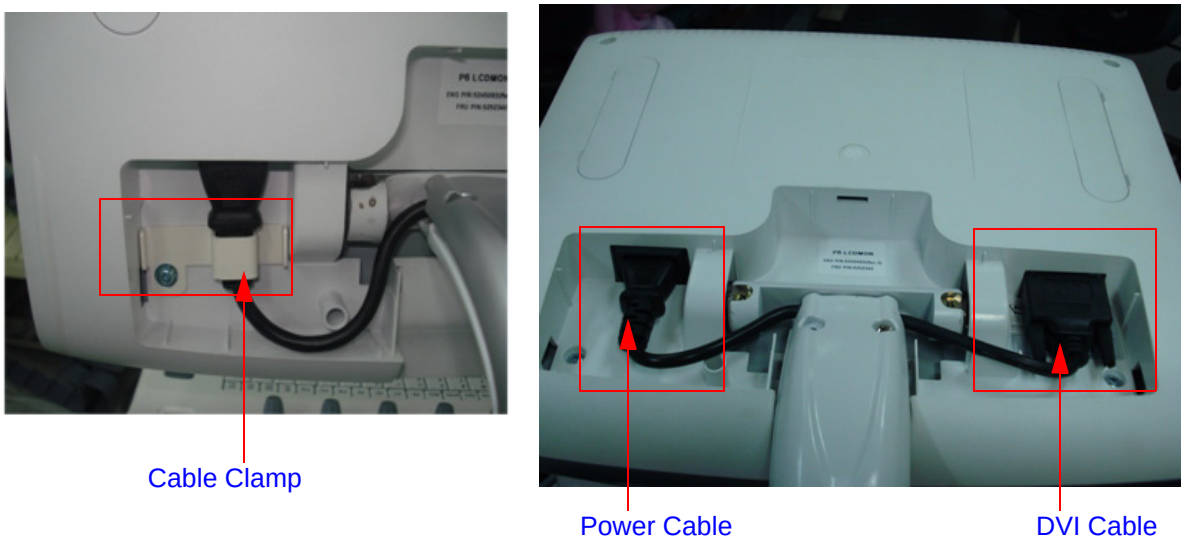


Figure 8-3 Power cable & DVI cable (LOGIQ P3)

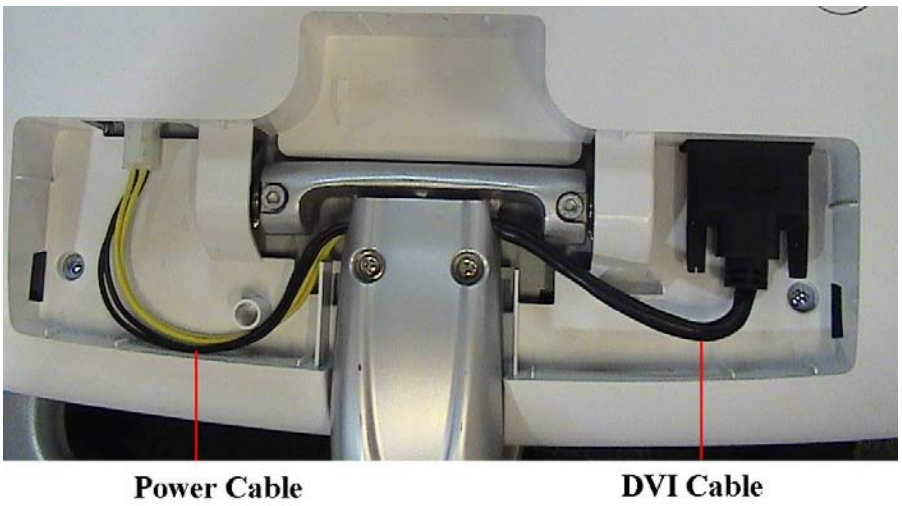


Figure 8-4 Power cable & DVI cable (LOGIQ P3 BT10)

8) disconnect the power cable & DVI cable from the LCD monitor system.Refer Figure 8-5 on page 8-6

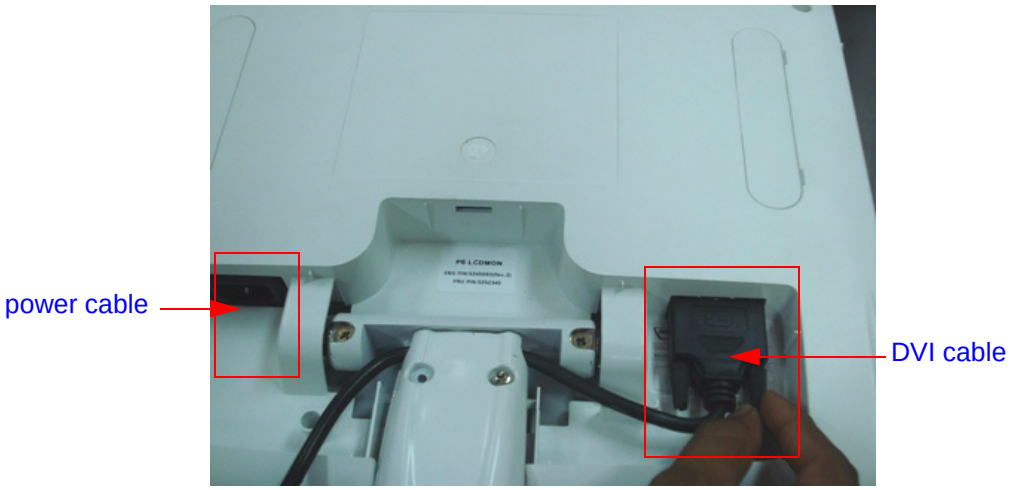


Figure 8-5 Remove Power cable & DVI cable

9) Loosen the two screw of (A,B) of LCD monitor Arm.Refer Figure 8-6 on page 8-7

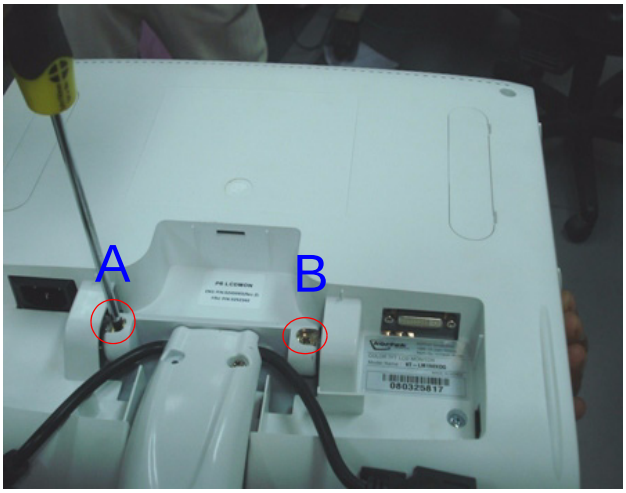


Figure 8-6 LCD monitor neck

10) Lift the LCD Assembly upward to remove it from the system. Refer Figure 8-7 on page 8-7

Figure 8-7 Lift LCD monitor

8-2-4-5 Mounting Procedure

1) Install the new parts in the reverse order of removal.

8-2-4-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-2-3. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-4	Adjusting the Display Monitor	

8-2-5 LCD Arm Cover (FRU P/N: 5310093)

This is a description on how to remove and replace the LCD Arm cover set.

8-2-5-1 Tools

- Common phillips screwdrivers

8-2-5-2 Needed Manpower

- 1 person, 15 minutes

8-2-5-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-2-5-4 Removal procedure

1) Remove LCD Power Cable cover & LCD Signal Cable Refer Refer section Section 8-3 on page 20

2) Remove LCD Arm cover Assembly .as shown below Figure 8-8 on page 8-8

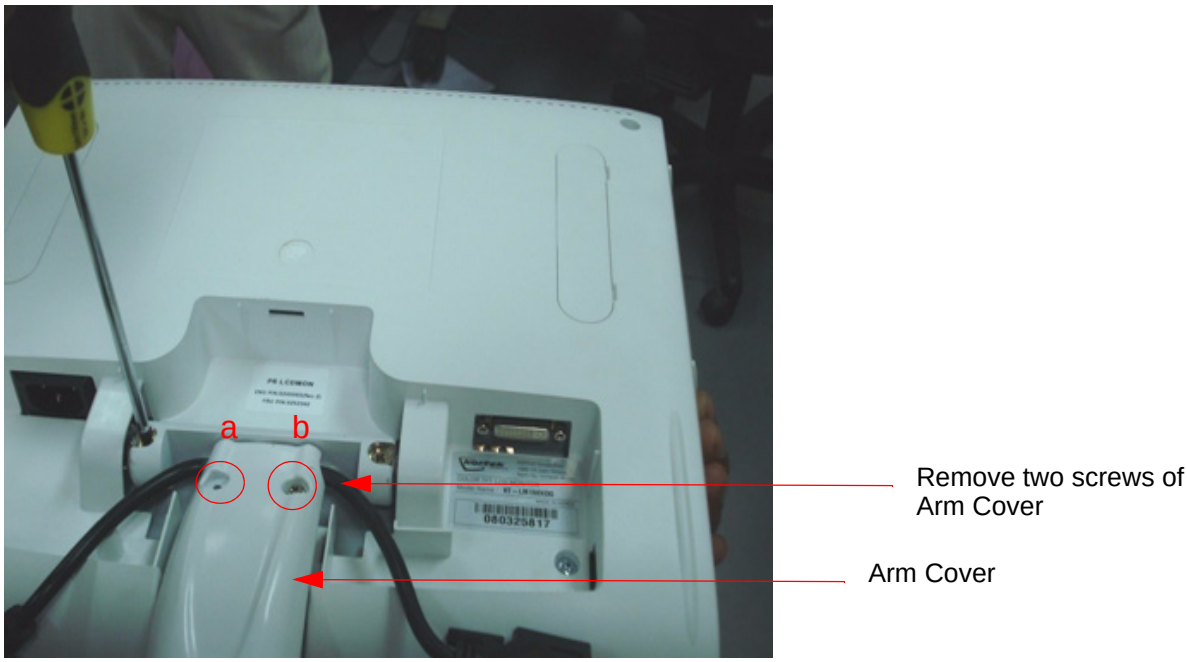


Figure 8-8 LCD Arm cover & monitor neck cover

8-2-5-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-2-5-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-2-4. Equipment passes all required tests and is ready for use.

8-2-6 Handle P3 Console (FRU P/N: 5315120)

This is a description on how to remove and replace the Handle P3 console Assembly.

8-2-6-1 Tools

- Common phillips screwdrivers; Allen Key Set.

8-2-6-2 Needed Manpower

- 1 person, 15 minutes

8-2-6-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-2-6-4 Removal procedure

1) Remove keyboard Top cover and Pull out the keyboard top assembly cover by the slot marked in the Figure 8-9 on page 8-9

2) Remove Gel holder and probe holder. Refer Refer section 8-3-1 on page 223) Using the allen key set remove Handle P3 console by unfastening the two socket head fasteners

marked (1,2,3) in the Figure 8-9 on page 8-9

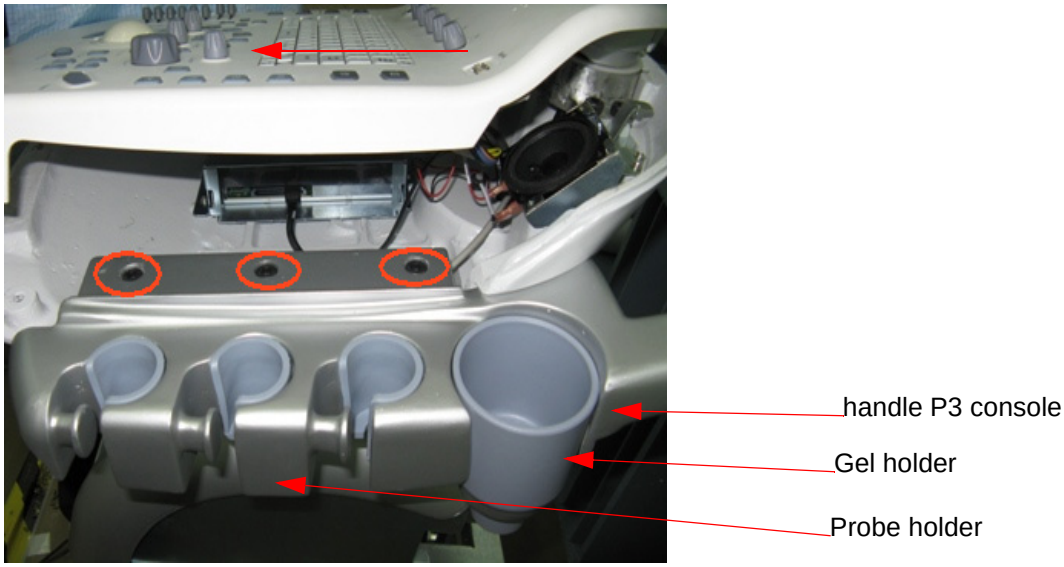


Figure 8-9 Handle P3 console

8-2-6-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-2-6-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-2-5. Equipment passes all required tests and is ready for use.

8-2-7 Keyboard Assembly (FRU P/N: 5314404)

This is a description on how to remove and replace the keyboard Assembly.

8-2-7-1 Tools

- Common Torx screwdrivers

8-2-7-2 Needed Manpower

- 1person, 10 minutes

Note: The Freeze key is part of Keyboard.

8-2-7-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-2-7-4 Removal Procedure

1) Unscrew the three screws (A,B,C) of keyboard bottom cover of the system.

Refer Figure 8-10 on page 8-10

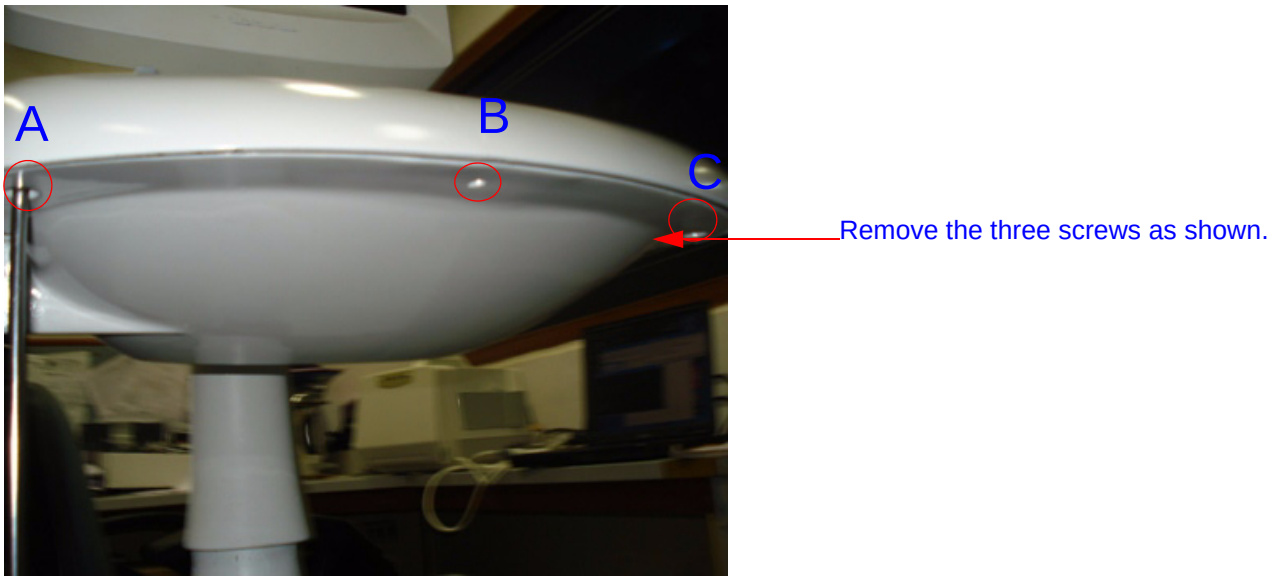


Figure 8-10 keyboard Bottom view

2) Lift the Keyboard Top view Assembly of Logiq P3 system.Refer Figure 8-11 on page 8-11

Figure 8-11 Move the keyboard out in the given direction

3) Remove USB cable from keyboard PCB Assembly of system.ReferFigure 8-12 on page 8-11

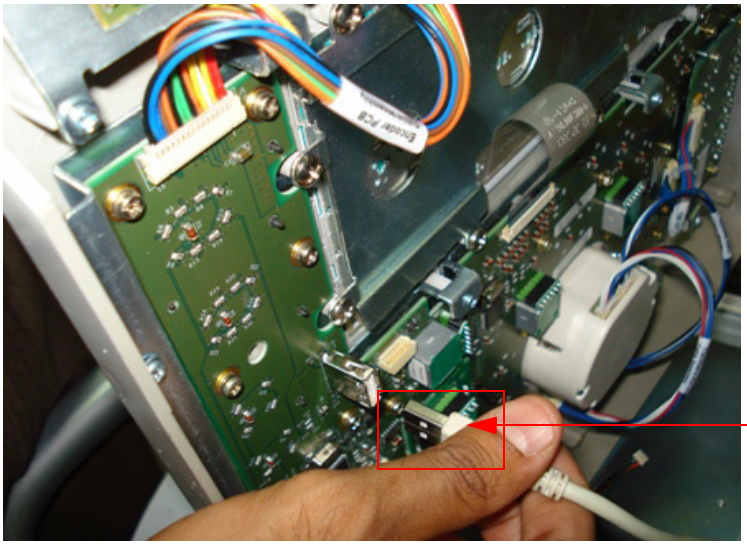


Figure 8-12 keyboard cable Location

4) Remove keyboard interface cable from keyboard Assembly of the system.

Refer Figure 8-13 on page 8-12

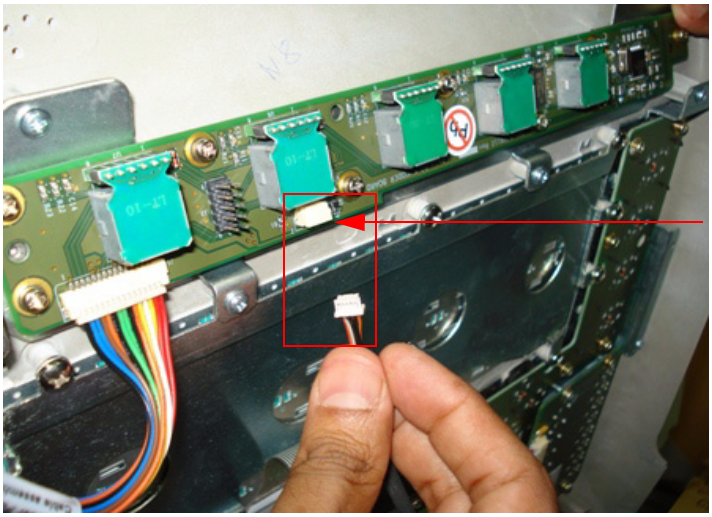


Figure 8-13 keyboard cable Location

5) Remove cable from keyboard Assembly of the system. Refer Figure 8-14 on page 8-12

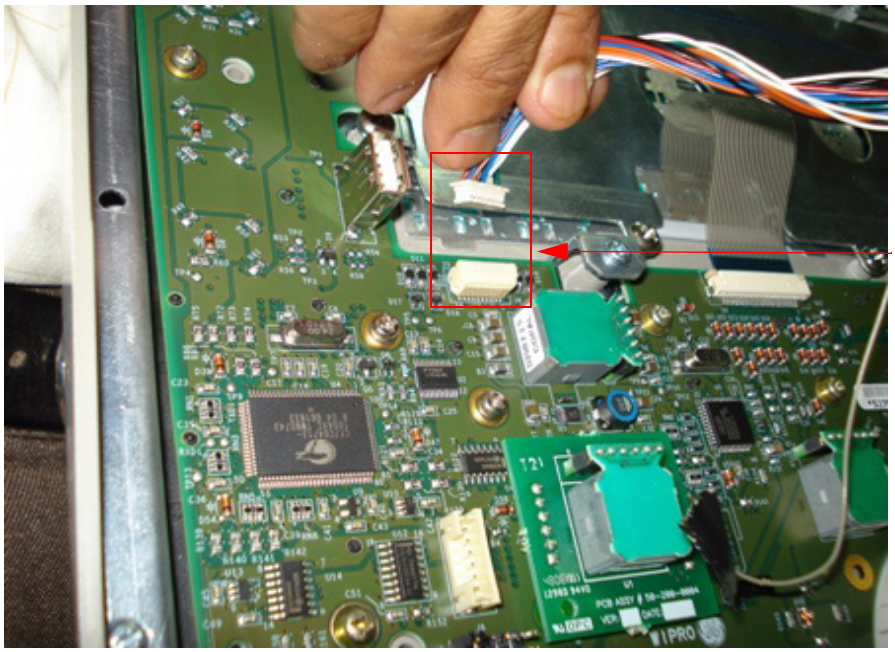


Figure 8-14 keyboard cable Location

8-2-7-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-2-7-6 Replace Keyboard Assembly

1.) Connect keyboard cable to the new Keyboard Assembly.
2.) Locate the Keyboard top hinge appropriately.

3.) Replace keyboard Assembly by fixing three screws (a,b,c).

4.) Refix Gel holder and Probe holders.

8-2-7-7 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-2-6. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

8-2-8 TGC PWA FRU Assy (FRU P/N: 5315107)

This is a description on how to remove and replace the TGC PWA Assembly.

8-2-8-1 **Tools**

- Common phillips screwdrivers

8-2-8-2 Needed Manpower

- 1 person, 10 minutes

8-2-8-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-2-8-4 Removal procedure

1) Remove keyboard Assembly. Refer Refer section 8-2-7 on page 10

2) Remove TGC Caps. (8 Nos.)

3) Remove TGC assembly by removing the four screws (as marked in Figure 8-15 on page 8-15)

PWA with TGC interface cable.

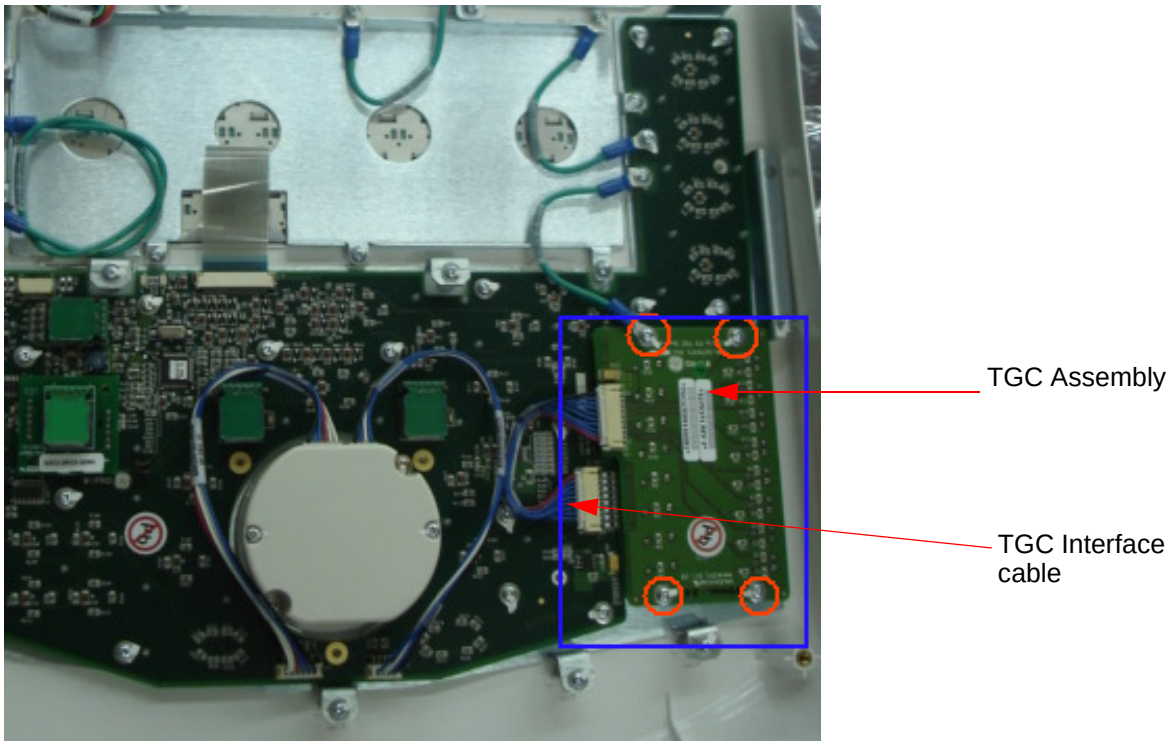


Figure 8-15 TGC PCB

8-2-8-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-2-8-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-2-7. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	

8-2-9 Alpha Numeric Keyboard with cables (FRU P/N: 5315106)

8-2-9-1 Tools

- Common phillips screwdrivers

8-2-9-2 Needed Manpower

- 1 person, 30 minutes

8-2-9-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-2-9-4 Removal procedure

1) Remove Keyboard Assembly.Refer section 8-2-7 on page 10

2) Remove the Alphanumeric Keyboard by unfastening the 10 screws (marked in Red color in Figure 8-16 on page 8-16) holding it & the Alphanumeric keyboard cable.

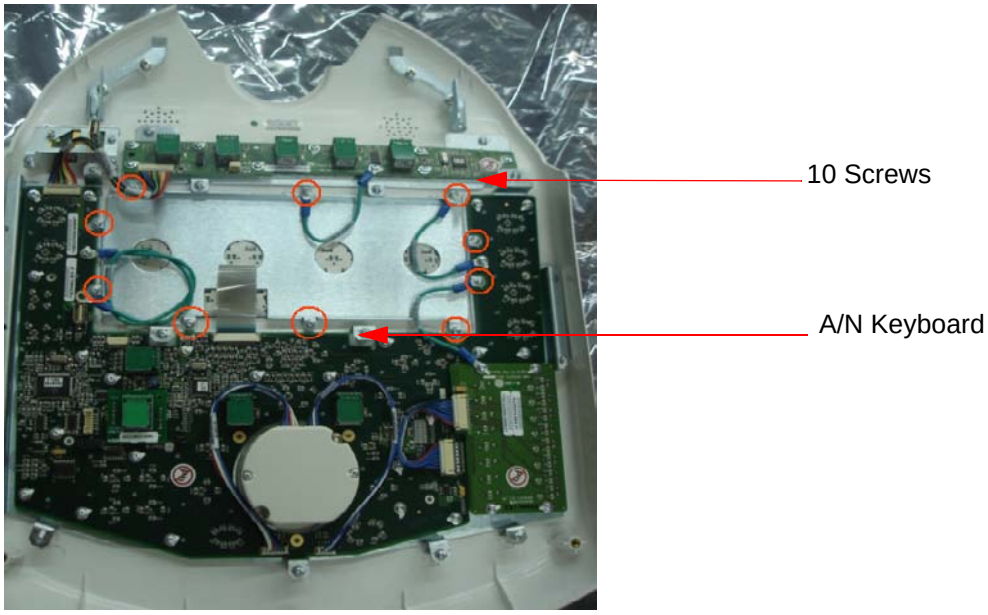


Figure 8-16 Alpha Numeric keyboard PCB

8-2-9-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-2-9-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-2-8. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	

8-2-10 Optical Trackball Assy (FRU P/N: 5315029)

This is a description on how to remove and replace the Optical Trackball Assembly.

8-2-10-1 Tools

- Common phillips screwdrivers

8-2-10-2 Needed Manpower

- 1 person, 10 minutes

8-2-10-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-2-10-4 Removal procedure

1) Remove Keyboard Assembly. Refer section 8-2-7 on page 10.

2) Unfasten the 2 screws(A,B) holding the trackball bracket (circled in Yellow color in Figure 8-17 on page 8-18)

3) Remove Trackball assembly with Trackball Interface cable.Refer Figure 8-17 on page 8-18

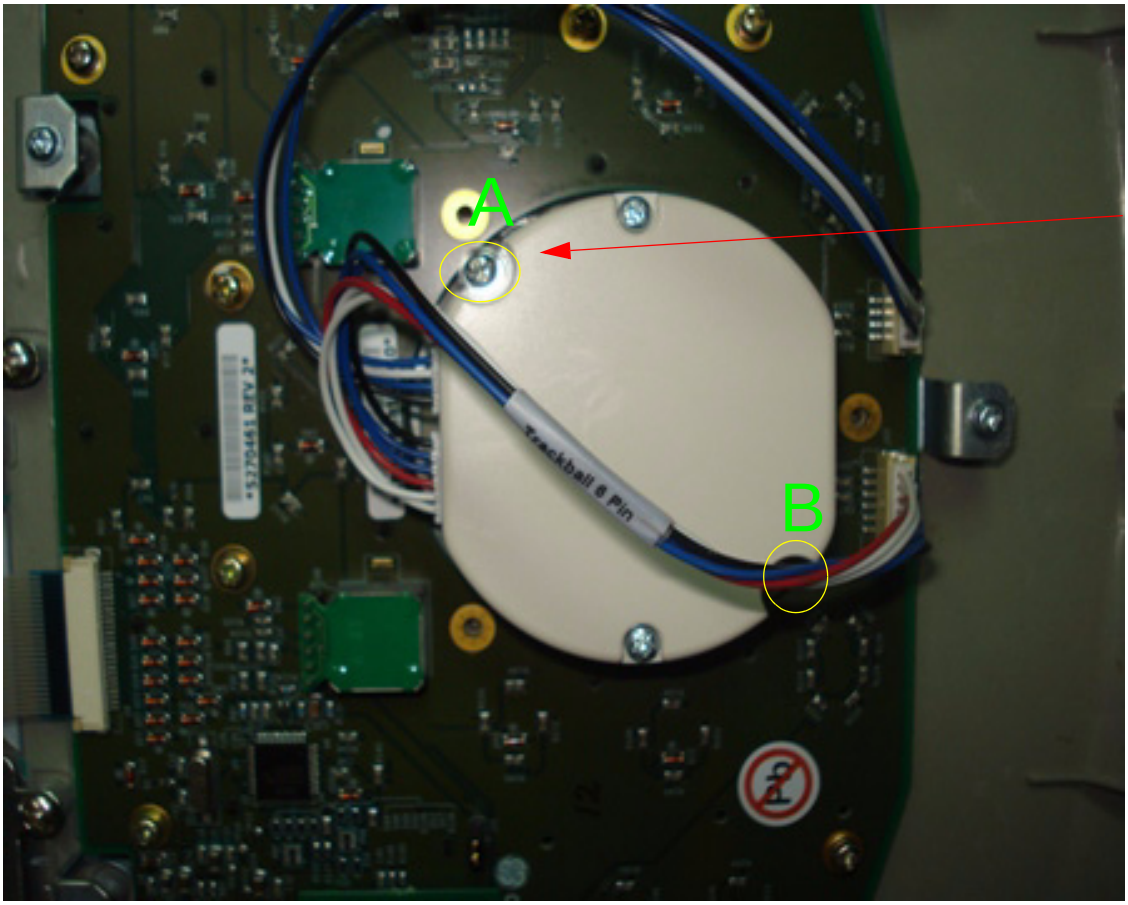


Figure 8-17 Optical Trackball Assembly

8-2-10-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-2-10-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-2-9. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	

Section 8-3 Keyboard Rear Cover Assy (FRU P/N: 5315122)

This is a description on how to remove and replace the keyboard cover Assembly.

8-3-0-1 Tools

- Common phillips screwdrivers

8-3-0-2 Needed Manpower

- 1 person, 15 minutes

8-3-0-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-3-0-4 Removal procedure

1) Remove Keyboard assembly. Refer Section 8-2-6

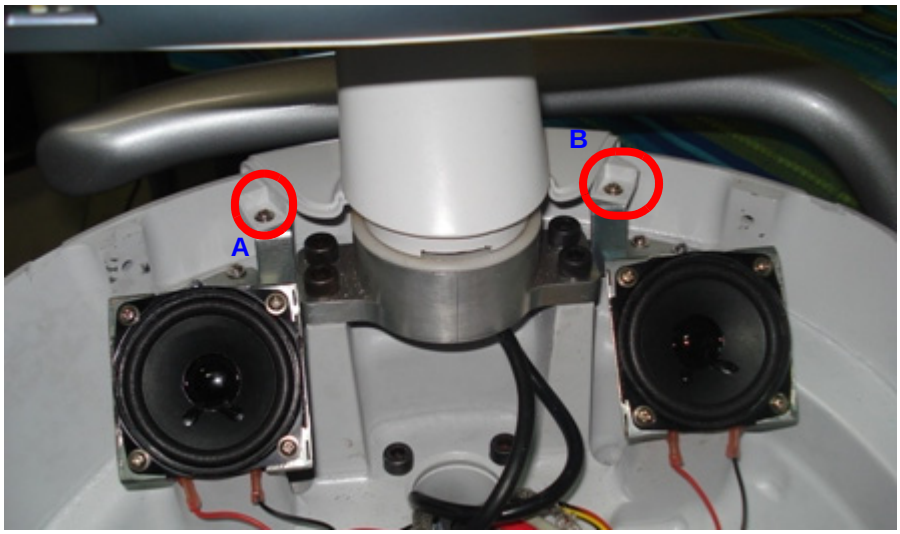


Figure 8-18 Keyboard

2) Remove the 2 screws (A,B) as shown in the figure above.

3) Remove LCD Arm cover as mentioned. Refer section 8-2-4 on page 8- 7

4) Remove the keyboard rear cover as shown below Figure 8-19 on page 8-21

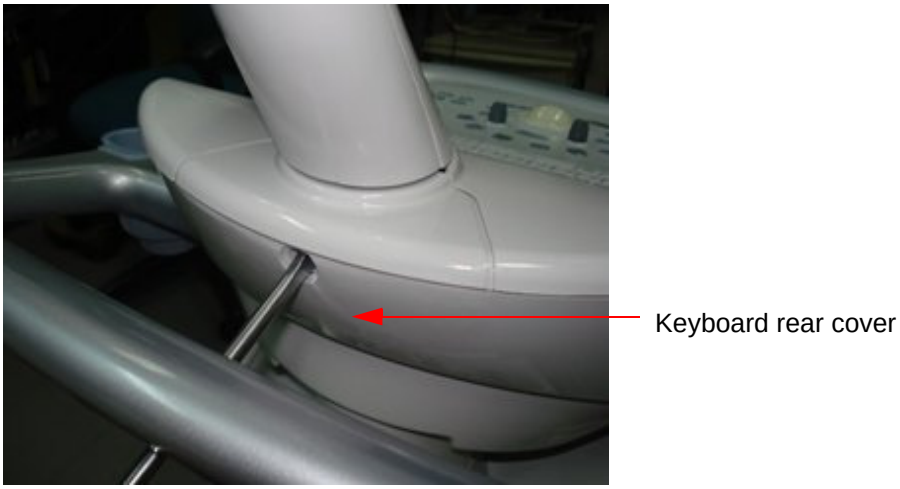


Figure 8-19 keyboard rear cover

8-3-0-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-3-0-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-3-1. Equipment passes all required tests and is ready for use.

8-3-1 Probe Holder (FRU P/N: 5168500) / Gel Bottle Holder (FRU P/N: 5168636)

This is a description on how to remove and replace the Probe holder Assembly.

8-3-1-1 Needed Manpower

- 1 person, 15 minutes

8-3-1-2 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-3-1-3 Removal procedure

1) Pull the probe holder out by slightly pushing it upwards with your hands.

Refer Figure 8-20 on page 8-22

Figure 8-20 Probe Holder

8-3-1-4 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-3-1-5 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-3-2. Equipment passes all required tests and is ready for use.

8-3-2 Keyboard Knob Set (FRU P/N: 5315502) & Encoder set (FRU P/N: 5262796)

This is a description on how to remove and replace the Keyboard knob set Assembly.

8-3-2-1 Tools

- Common phillips screwdrivers

NOTE: B Mode Gain Knob Encoder is not a FRU.

8-3-2-2 Needed Manpower

- 1 person, 15 minutes

8-3-2-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-3-2-4 Removal procedure

1) Pull the knobs out with hands by slightly pushing it up from the bottom edge.Refer Figure 8-21 on page 8-23

Figure 8-21 Keyboard knob set

8-3-2-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-3-2-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-3-3. Equipment passes all required tests and is ready for use.

Section 8-4Mechanicals

8-4-1 RH Side Cover (FRU No :5315115)

This is a description on how to remove and replace the Right Cover.

8-4-1-1 Tools

- Common Torx screwdrivers

8-4-1-2 Needed Manpower

- 1 person, 15 minutes

8-4-1-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-4-1-4 Removal Procedure

1) Remove the screw cap of four places(1,2,3,4,) on RH-side cover of the system.

Refer Figure 8-22 on page 8-24

2) Remove the RH-side cover from the system. **Refer Figure 8-22 on page 8-24**

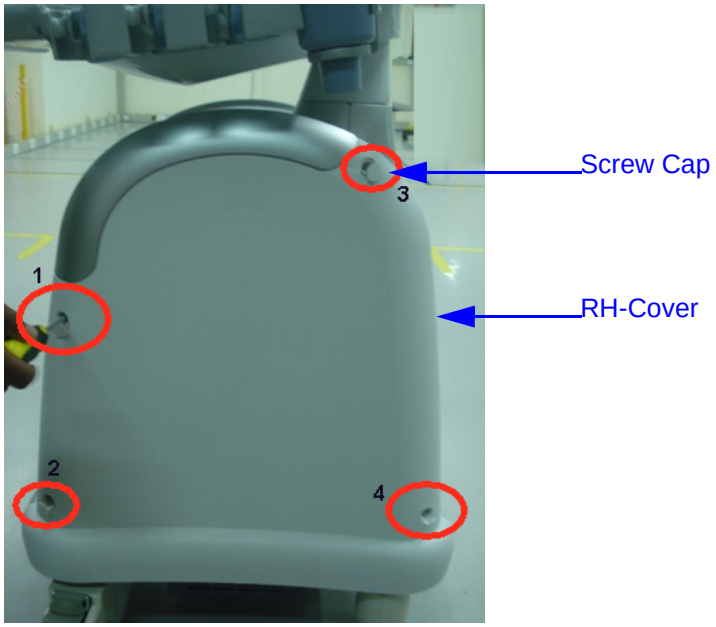


Figure 8-22 RH-side cover

3) Remove the RH-side cover four screws(1, 2, 3, 4) of the system. Refer Figure 8-23 on page 8-25

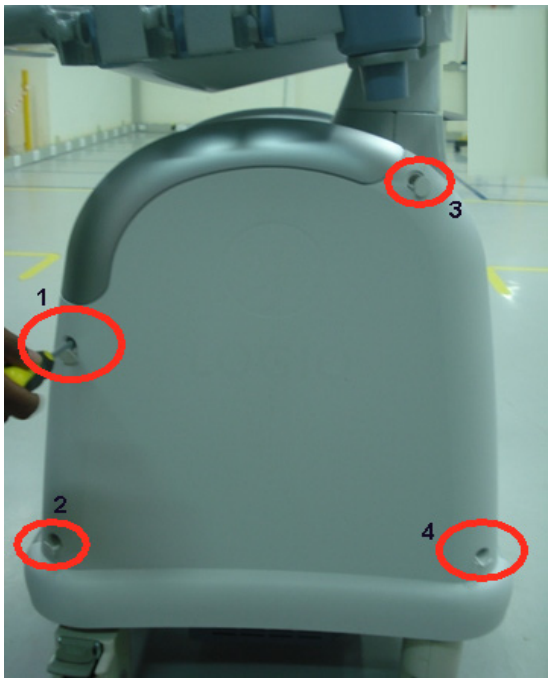


Figure 8-23 RH-side cover

8-4-1-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-4-1-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-4-1. Equipment passes all required tests and is ready for use.

8-4-2 LH Side Cover (FRU No: 5315114)

This is a description on how to remove and replace the Left Cover.

8-4-2-1 Tools

- Common Torx screwdrivers

8-4-2-2 Needed Manpower

- 1person, 15 minutes

8-4-2-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-4-2-4 Removal Procedure

1.) Remove the screw cap of four places (1,2,3,4).
2.) Unscrew 4 screws (1,2,3,4).
3.) Remove the Left cover in the direction as shown in the figure below.

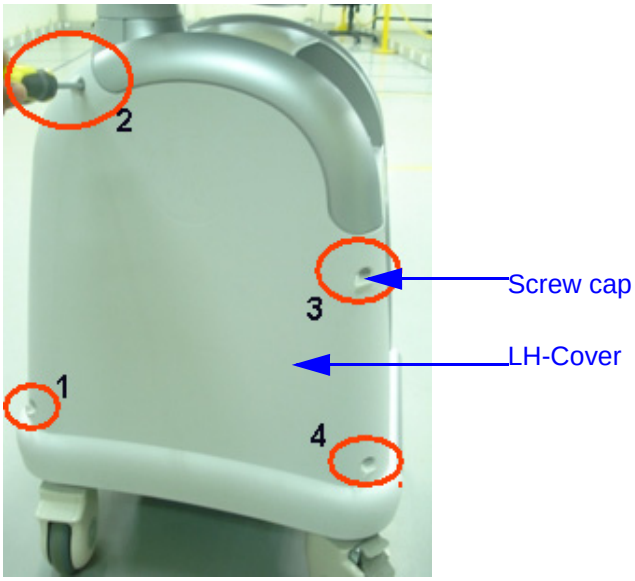


Figure 8-24 Left Cover

8-4-2-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-4-2-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-4--2. Equipment passes all required tests and is ready for use.

8-4-3 Rear Cover (FRU No. 5315117)

Purpose: This is a description on how to remove and replace the Rear Cover.

8-4-3-1 Tools

- Common Phillips screwdrivers

8-4-3-2 Needed Manpower

- 1 persons, 15 minutes

8-4-3-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-4-3-4 Removal Procedure

1.) Remove RH-side cover from the system.Refer section 8-4-1 on page 24

2) Remove LH-side cover from the system.Refer section 8-4-2 on page 26

3) Remove the two screws (A,B) RH- side from the system.Refer Figure 8-27 on page 8-28

Figure 8-25 Rear cover

5) Loosen the two screws (A,B) LH- side from the system.Refer Figure 8-26 on page 8-27

Figure 8-26 Removing screws of rear cover

6) Loosen Rear cover RH-Side from the system.Refer Figure 8-27 on page 8-28

Figure 8-27 Removing screws of rear cover

8-4-3-5 Mounting procedure

1.) Install the new parts in the reverse order of removal

8-4-3-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-4--3. Equipment passes all required tests and is ready for use.

8-4-4 Front Cover (FRU No.5315116)

This is a description on how to remove and replace the Front Cover.

8-4-4-1 Tools

- Common Phillips screwdrivers

8-4-4-2 Needed Manpower

- 1 persons, 15 minutes

8-4-4-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-4-4-4 Removal Procedure

1) Remove the RH-side cover from the system.Refer section 8-4-1 on page 24

2) Remove the LH-side cover from the system.Refer section 8-4-2 on page 26

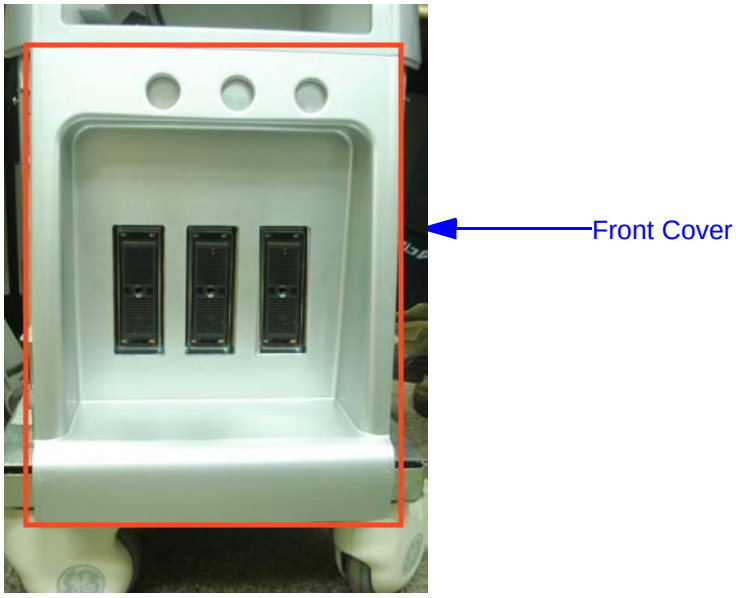


Figure 8-28 Front cover

3)Remove the two screws (A,B) LH- side of the system. Refer Figure 8-29 on page 8-30

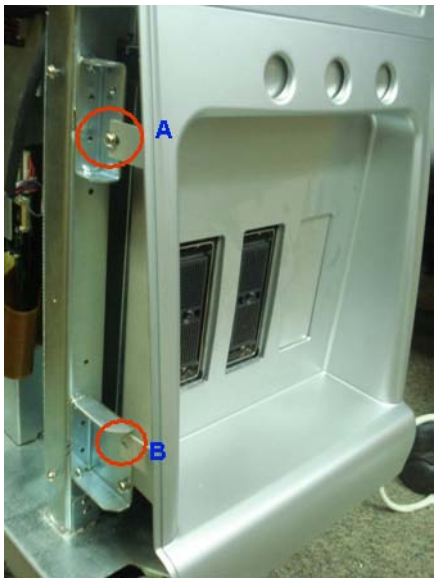


Figure 8-29 Removing side screws of front cover

4) Remove the two screws (A,B) RH- side of the system. Refer Figure 8-30 on page 8-30

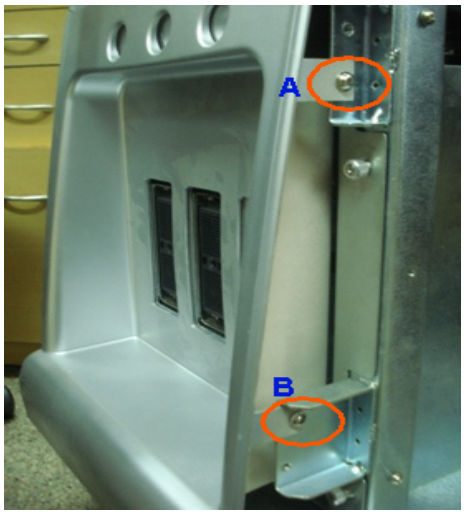


Figure 8-30 Removing side screws of front cover

8-4-4-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-4-4-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-4--4. Equipment passes all required tests and is ready for use.

8-4-5 Top Cover (FRU P/N: 5315121)

This is a description on how to remove and replace the Top cover Assembly.

8-4-5-1 Tools

- Common Phillips screwdrivers

8-4-5-2 Needed Manpower

- 1person, 15 minutes

8-4-5-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-4-5-4 Removal Procedure

1) Remove the LH-side cover from the system. Refer section 8-4-2 on page 26

2) Remove the RH-side cover from the system. Refer section 8-4-1 on page 24

3) Remove the Front cover from the system. Refer section 8-4-4 on page 29

4) Remove the Rear cover from the system. Refer section 8-4-7 on page 36

5) loosen two screws (A.B) in front side of top cover from the system. Refer Figure 8-31 on page 8-32

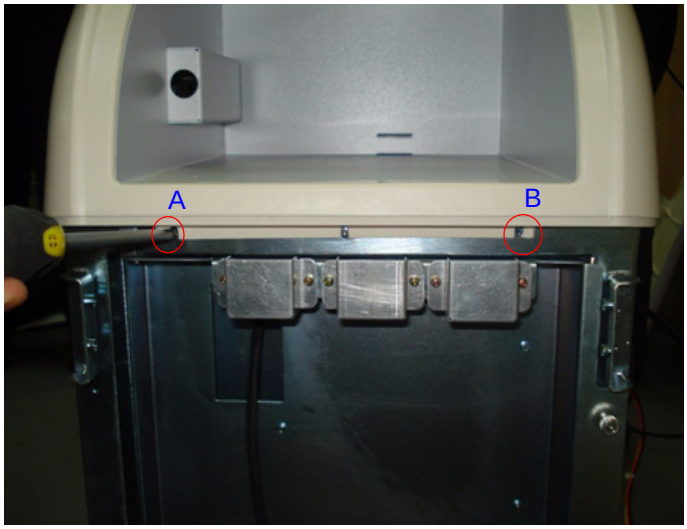


Figure 8-31 Top cover

6) Remove the LH-side Emi cover and remove two screws from LH -side Bottom of the top assembly of the system.Refer Figure 8-32 on page 8-33

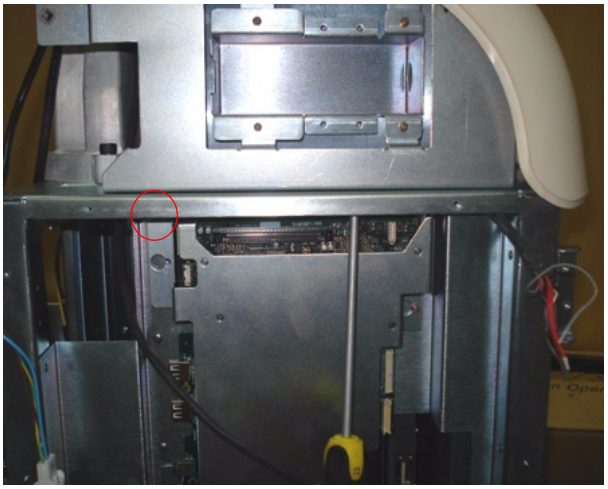


Figure 8-32 Removing screw top assembly

7) Remove RH-side Emi cover and remove two screws from RH -side bottom of the top assembly of the system. Refer Figure 8-33 on page 8-33

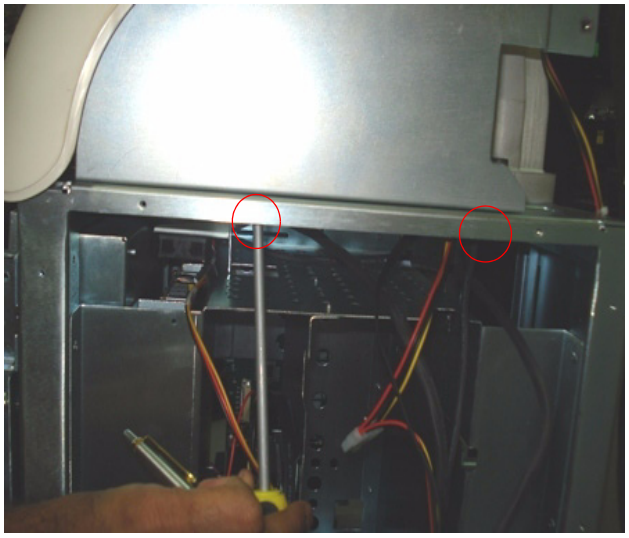


Figure 8-33 Removing screw top assembly

8) Remove the top whole assembly by pulling the top assembly front side from the system. Refer Figure 8-34 on page 8-34

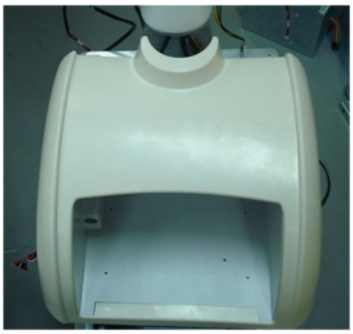


Figure 8-34 Top assembly

9) The top assembly should be to removed from two locating pins (A,B). Refer Figure 8-35 on page 8-34

Figure 8-35 Top assembly

8-4-5-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-4-5-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-4-5. Equipment passes all required tests and is ready for use.

8-4-6 Caster Wheel Front (FRU P/N :5315118 - LP3, 5368246 - LP3BT10) / Caster Wheel Rear (FRU P/N: 5315119 - LP3, 5368247 - LP3 BT10)

This is a description on how to remove and replace the castor wheel front and castor wheel rear .

8-4-6-1 Tools

- Common Phillips screwdrivers; Allen Key Set.

8-4-6-2 Needed Manpower

- 1person, 15 minutes each

8-4-6-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-4-6-4 Removal Procedure

1) Remove the Transformer assy. Refer section 8-7-1 on page 69

2) Lift the system slightly up on the side of the castor wheel that needs replacement

3) Place a small block of the size of castor wheel to balance the system

4) Using the allen key set, unfasten the 4 Hex screws holding the Castor wheel and remove it

Refer Figure 8-36 on page 8-35

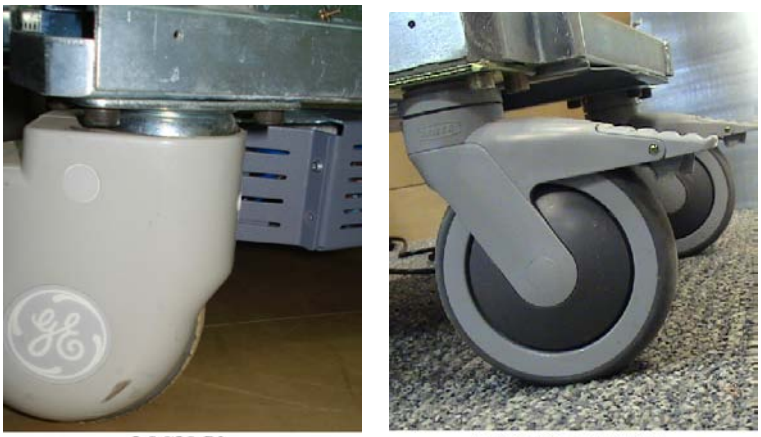


Figure 8-36 Castor wheel

8-4-6-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-4-6-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspectionand roll system around and ensure smooth wheel rotation and sweivwl	Service Manual Direction 5308917-100, Section 8-4-6. Equipment passes all required tests and is ready for use.

8-4-7 Rear EMI Cover (Part of EMI Cover Assy FRU P/N: 5315111)

This is a description on how to remove and replace the Right EMI Cover **(P/N :**5308951**)**.

8-4-7-1 Tools

- Common phillips screwdrivers

8-4-7-2 Needed Manpower

- 1 person, 15 minutes

8-4-7-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-4-7-4 Removal Procedure

1) Remove Right cover. Refer section 8-4-3 on page 27 for details on how to remove Right cover.

2) Remove rear cover. Refer section 8-4-3 on page 27

3)Use the scewdriver and Loose the Five screws (1,2,3,4,5)

4) Remove Rear-side EMI cover. Refer Figure 8-37 on page 8-36 for details on how to remove Rear cover.

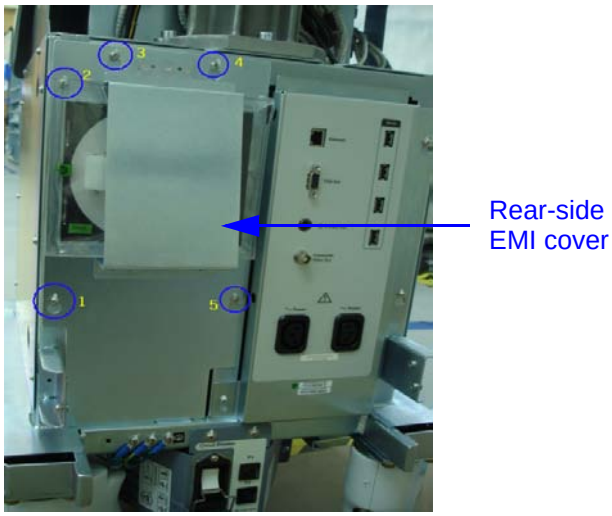


Figure 8-37 Rear-side EMI cover

8-4-7-5 Mounting procedure

Install the new parts in the reverse order of removal

8-4-7-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-4-7. Equipment passes all required tests and is ready for use.

8-4-8 Right EMI Cover (Part of EMI Cover Assy FRU P/N: 5315111)

This is a description on how to remove and replace the Right EMI Cover **(P/N :5308965)**.

8-4-8-1 Tools

- Common phillips screwdrivers

8-4-8-2 Needed Manpower

- 1 person, 15 minutes

8-4-8-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-4-8-4 Removal Procedure

1) Remove Right cover. Refer section 8-4-3 on page 27 for details on how to remove Right cover.

2) Use the scewdriver and Loose the eight screws (1,2,3,4,5,6,7,8)

3) Slide and remove RH-side EMI cover. Refer Figure 8-38 on page 8-37 for details on how to remove Right cover.

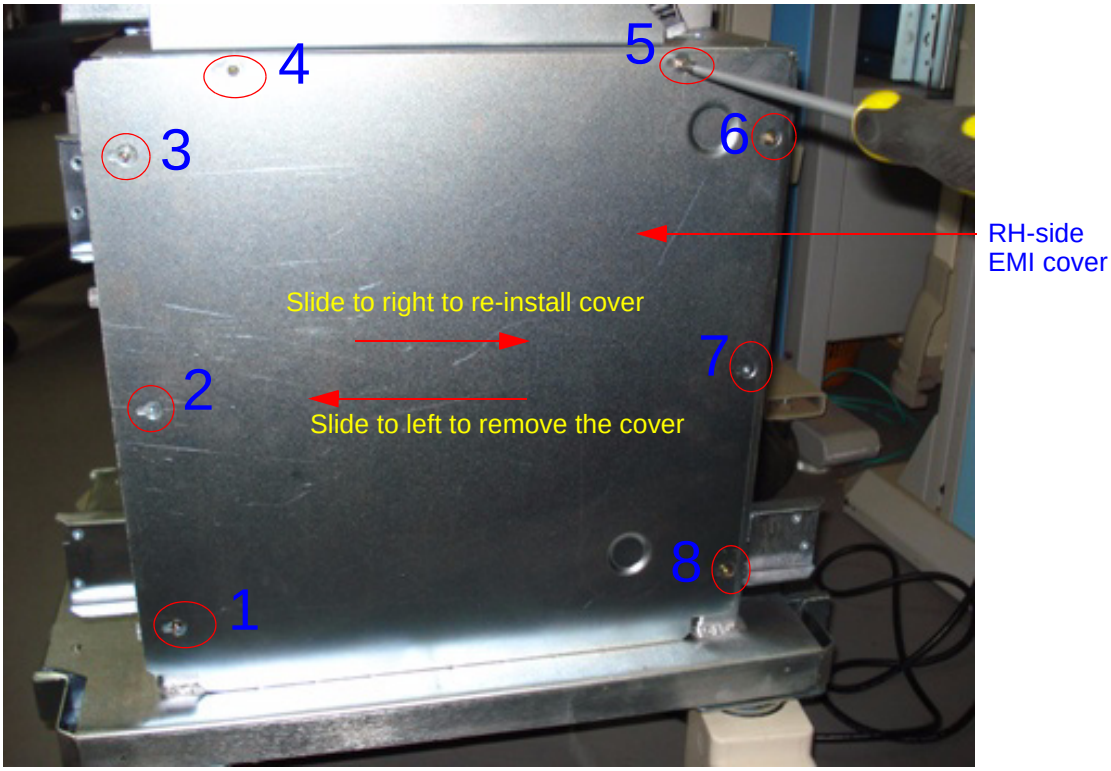


Figure 8-38 RH-side EMI cover

8-4-8-5 Mounting procedure

Install the new parts in the reverse order of removal

8-4-8-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-4--8. Equipment passes all required tests and is ready for use.

8-4-9 Left EMI Cover (Part of EMI Cover Assy FRU P/N: 5315111)

This is a description on how to remove and replace the Left EMI Cover.**(P/N : 5308964)**

8-4-9-1 Tools

- Common Phillips screwdrivers

8-4-9-2 Needed Manpower

- 1person, 15 minutes

8-4-9-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-4-9-4 Removal Procedure

1) Remove Left cover. Refer section 8-4-1 on page 24 for details on how to remove Left cover.

3) eight screws to be unfastened of LH -side EMI cover of Logiq P3 system.

Refer Figure 8-39 on page 8-39

2) Remove LH- side EMI cover. Refer Figure 8-39 on page 8-39 for details on how to remove Left cover.

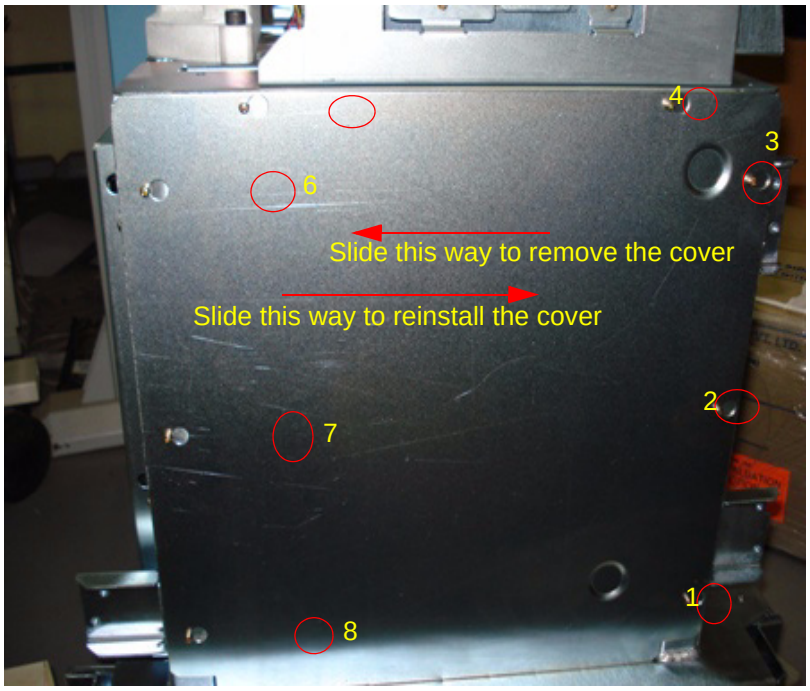


Figure 8-39 LH -side EMI cover

4) Use Screwdriver & Loose eight screws (1,2,3,4,5,6,7,8,), from LH-side EMI cover of Logiq P3 system

Refer Figure 8-40 on page 8-40

Figure 8-40 Loosen screw of LH- side EMI cover

5) Remove LH- side EMI cover of Logiq P3 system. Refer Figure 8-41 on page 8-40

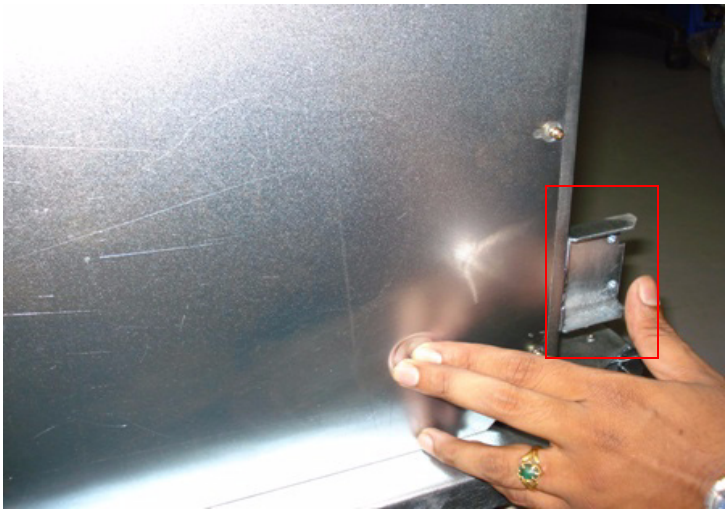


Figure 8-41 Remove LH- side EMI cover

8-4-9-5 Mounting procedure

Install the new parts in the reverse order of removal.

8-4-9-6 Functional Checkout Procedure

Functional Test	Debrief Script
Do Visual Inspection and ensure no scratches observed and fitment is done properly	Service Manual Direction 5308917-100, Section 8-4-9. Equipment passes all required tests and is ready for use.

8-4-10 MST BOARD ASSEMBLY (P/N: 5315025 - LP3, 5388844 - LP3BT10) SOM (P/N: 5308994 - LP3, 5308994 - LP3Bt10)

This is a description on how to remove and replace the cable assembly of MST board and SOM.

8-4-10-1 Tools

- Common Phillips screwdrivers

8-4-10-2 Needed Manpower

- 1person, 15 minutes

8-4-10-3 Preparations

Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system

8-4-10-4 Removal Procedure

1) Removal of all cable assembly from MST to TX as shown below Figure 8-42 on page 8-41

2) Use a screwdriver to remove the two screw holding the flexi cable to the MST board.

Refer Figure 8-42 on page 8-41

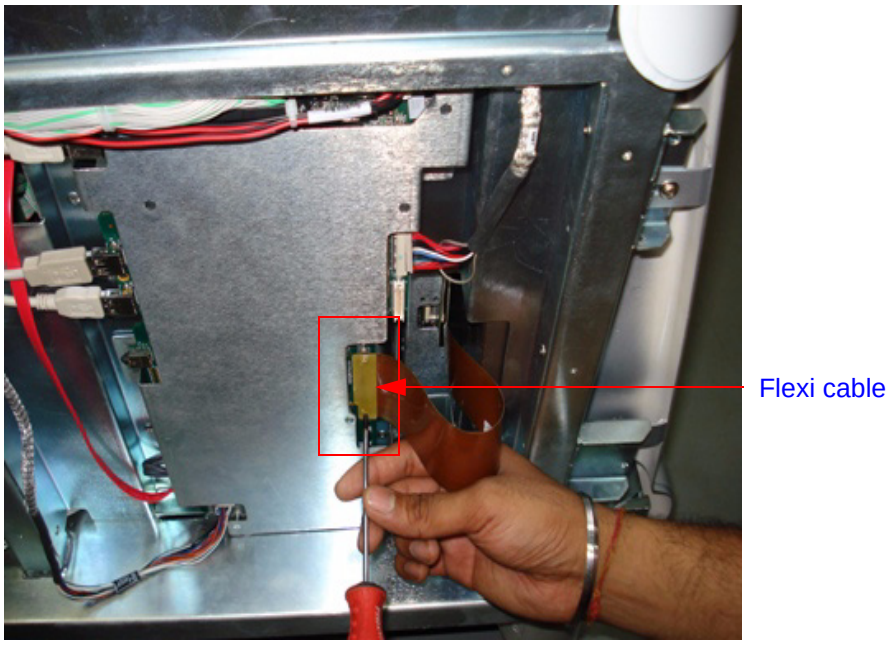


Figure 8-42 Removing Flexi cable of MST board

3) Remove USB cable from MST board Refer Figure 8-43 on page 8-42

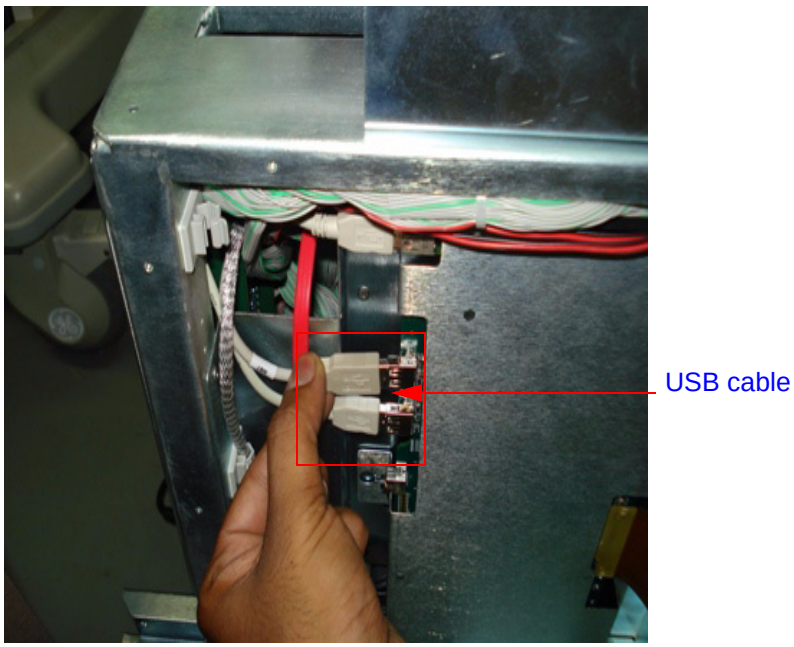


Figure 8-43 Removing USB cable of MST board

4) For **LOGIQ P3** - Remove the FRC cable from MST board Refer Figure 8-44 on page 8-42

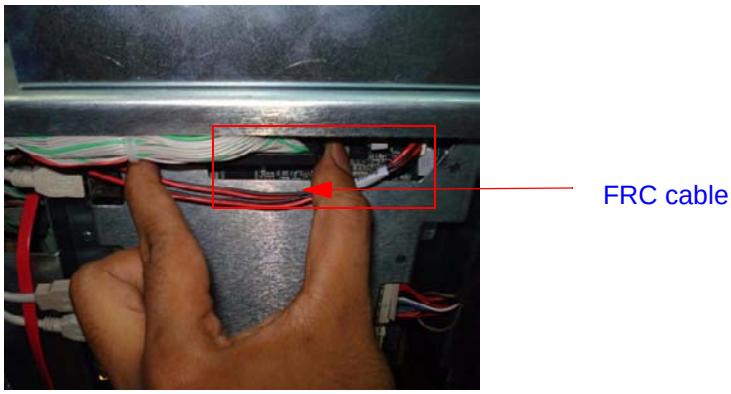


Figure 8-44 Removing FRC cable of MST board

5) For **LOGIQ P3BT10** - Remove the Video signal (VGA) cable from MST board as shown below.

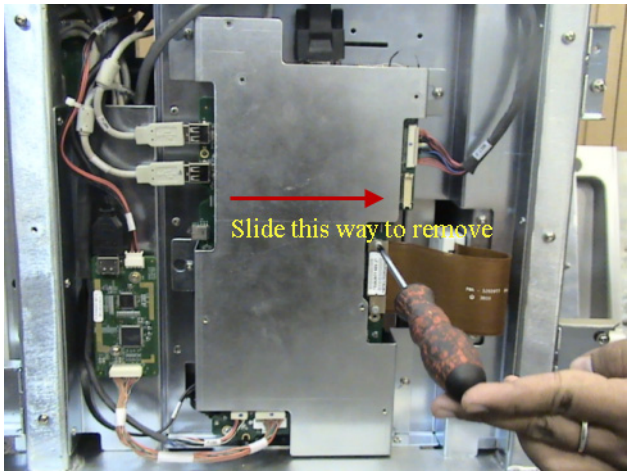


Figure 8-45 Removing the VGA cable

6) Remove the Audio cable from MST board Refer Figure 8-46 on page 8-43

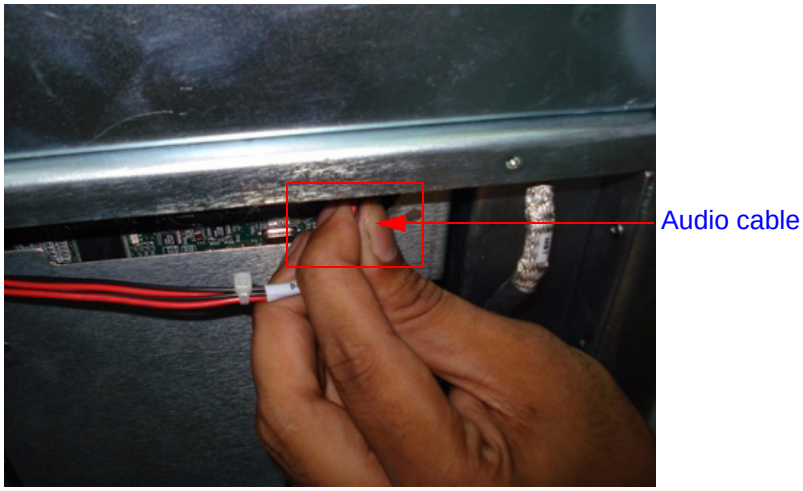


Figure 8-46 Removing Audio cable of MST board

7) Remove the Power cable from MST board Refer Figure 8-47 on page 8-44

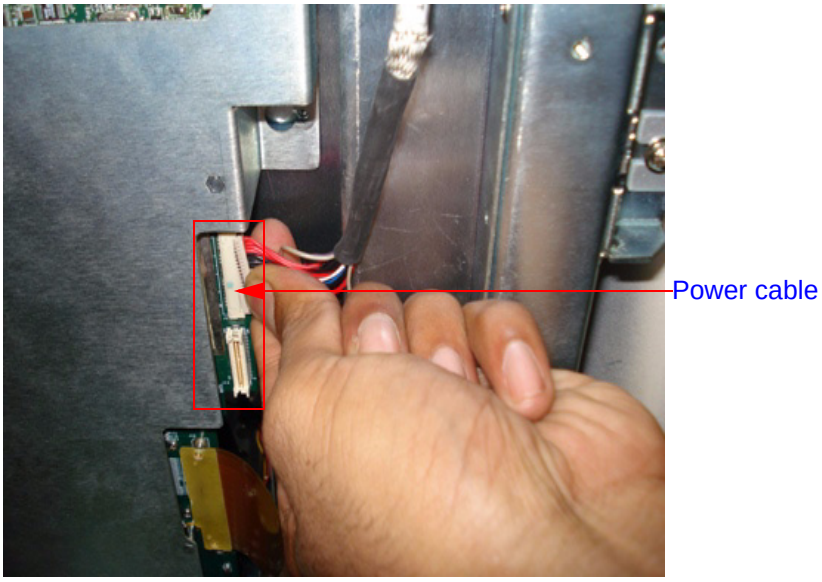


Figure 8-47 Removing Power cable of MST board

8) Loosen the 4 screws and slide the MST assembly as shown in the Fig A.

Fig A

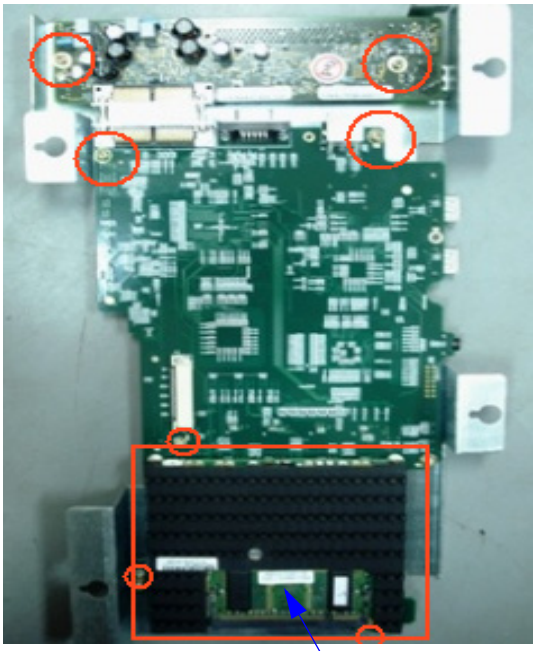


Fig B

After removing the MST PCB on the other side remove the four screws to remove SOM as shown in Fig B.

Figure 8-48 MST Assy (LOGIQ P3)

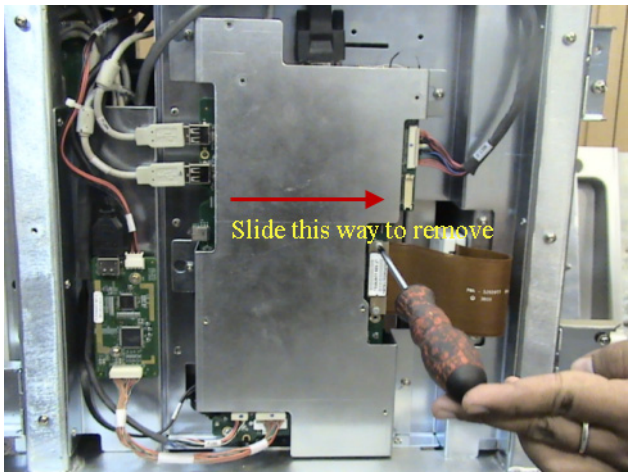


Figure 8-49 MST Assy (LOGIQ P3BT10)

8-4-10-5 Mounting procedure

Install the new parts in the reverse order of removal.

8-4-10-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-4-10. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	
4-3-7	M Mode Controls	
4-3-8	Color Flow Mode Checks	
4-3-9	Doppler Mode Checks	

8-4-11 HARD DISK DRIVE ASSEMBLY (PART NO:5315113)

8-4-11-1 Tools

- Common Phillips screwdrivers

8-4-11-2 Needed Manpower

- 1person, 15 minutes

8-4-11-3 Preparations

Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system

8-4-11-4 Removal Procedure

1) Remove Right side cover and Right side EMI cover. Refer Section 8-4-8 on page 8-37

2) Loosen the One screw (A) and pull out the hard disk drive assembly as shown in Figure 8-50 on page 8-46

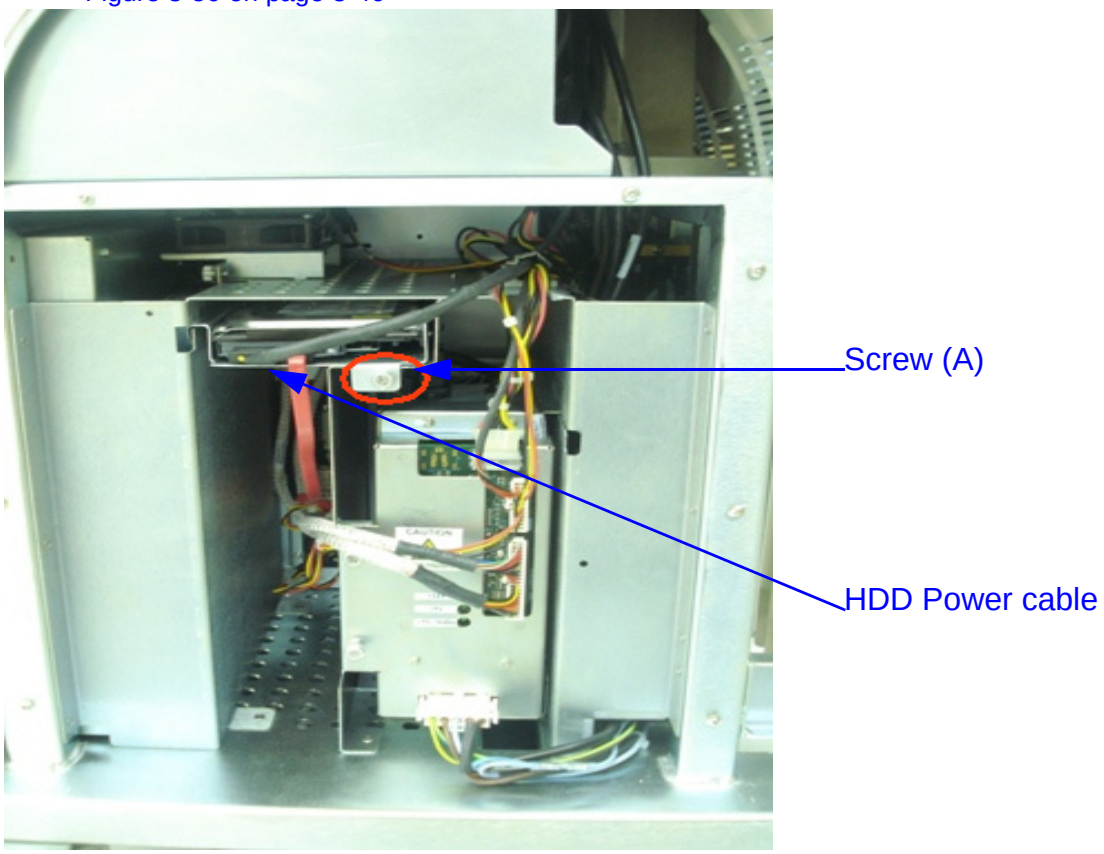


Figure 8-50 Removing Hard Disk Drive Power cable

3) Remove SATA cable from Hard disk drive assembly Refer Figure 8-51 on page 8-47

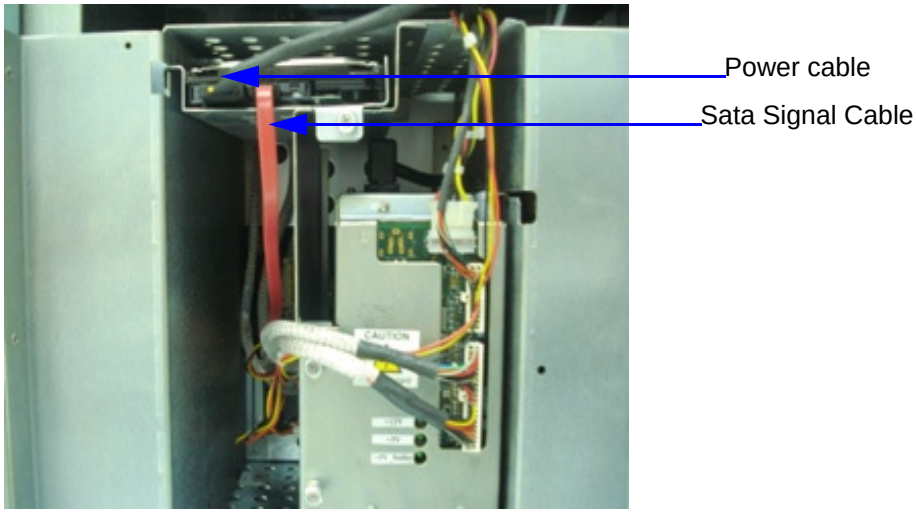


Figure 8-51 Removing SATA cable

8-4-11-5 Mounting procedure

Install the new parts in the reverse order of removal.

8-4-11-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-4-11. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

Section 8-5 USB Cable Set (FRU P/N: 5315039)

8-5-0-1 Tools

- Common Phillips screwdrivers

8-5-0-2 Needed Manpower

- 1 persons, 15 minutes per cable

8-5-0-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-5-0-4 Removal Procedure

1. Remove the covers and parts as applicable. Refer to the applicable section of this document.
2. Unplug the USB cable from both the ends and remove the cable from the machine.

8-5-0-5 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Proprietary Service Manual Direction 5308917-100, Section 8-5. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

8-5-1 LV and Power distribution Board (Part No: 5315028) / Power distribution Board Assembly (Part no :5315104) - LOGIQ P3

8-5-1-1 Tools

- Common Phillips screwdrivers

8-5-1-2 Needed Manpower

- 1person, 15 minutes

8-5-1-3 Preparations

Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system

8-5-1-4 Removal Procedure

1) Loosen the Two screw (A) and pull out the Cables which are connected to PDB as shown in rectangle box (B) in the Figure 8-50 on page 8-46

2) Remove LV & PDB assembly.Refer Figure 8-50 on page 8-46

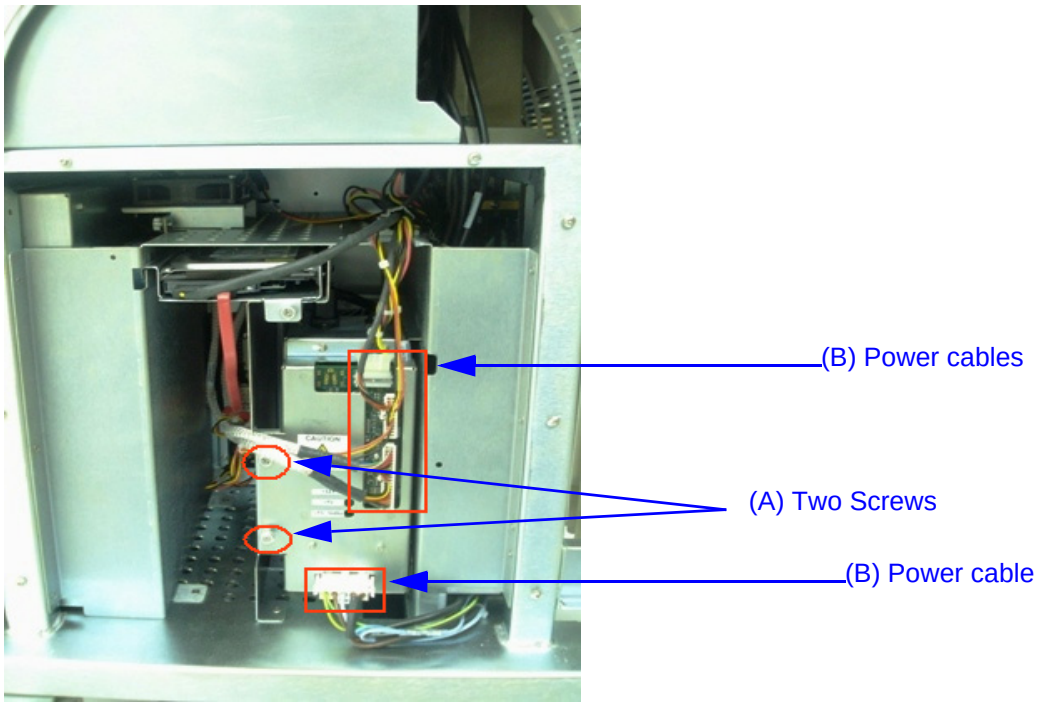


Figure 8-52 Removing Hard Disk Drive Power cable

3) Remove SATA cable from Hard disk drive assembly Refer Figure 8-51 on page 8-47

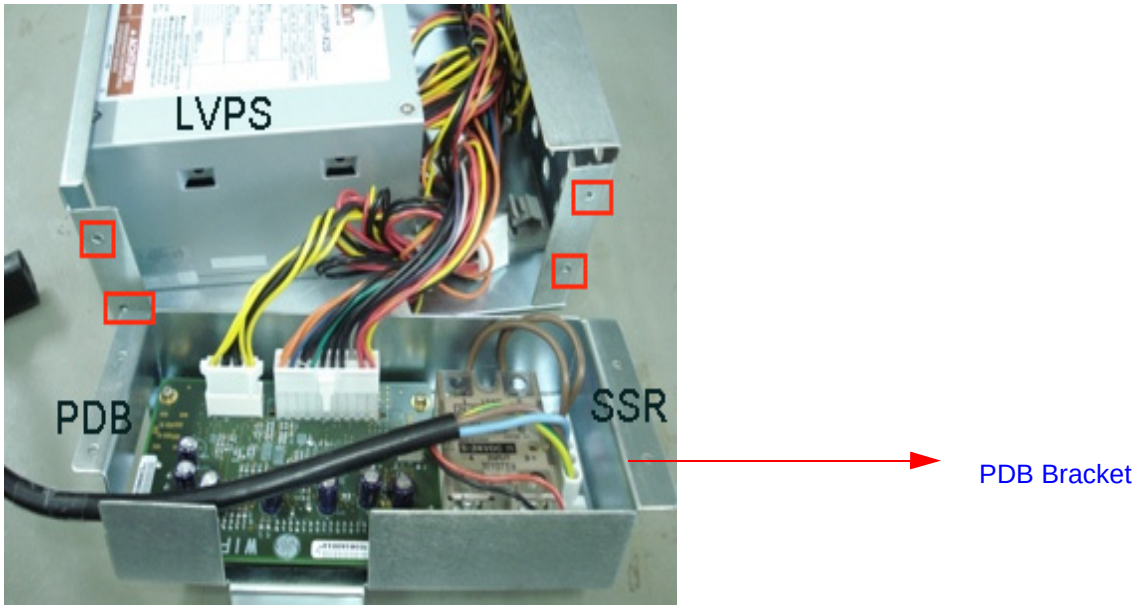


Figure 8-53 Removing SATA cable

8-5-1-5 Mounting procedure

Install the new parts in the reverse order of removal.

8-5-1-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-5-1. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

8-5-2 Power distribution Board Assembly (P/N: 5370455), PDB Sub (P/N: 5370323), PDB Sub (Part no.: 5397797) - LOGIQ P3BT10

8-5-2-1 Tools

- Common Phillips screwdrivers

8-5-2-2 Needed Manpower

- 1person, 15 minutes

8-5-2-3 Preparations

Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system

8-5-2-4 Removal Procedure

1) Loosen the two screws (A) and pull out the Cables which are connected to PDB as shown in rectangle box (B) in the figure.

2) Remove PDB assembly.

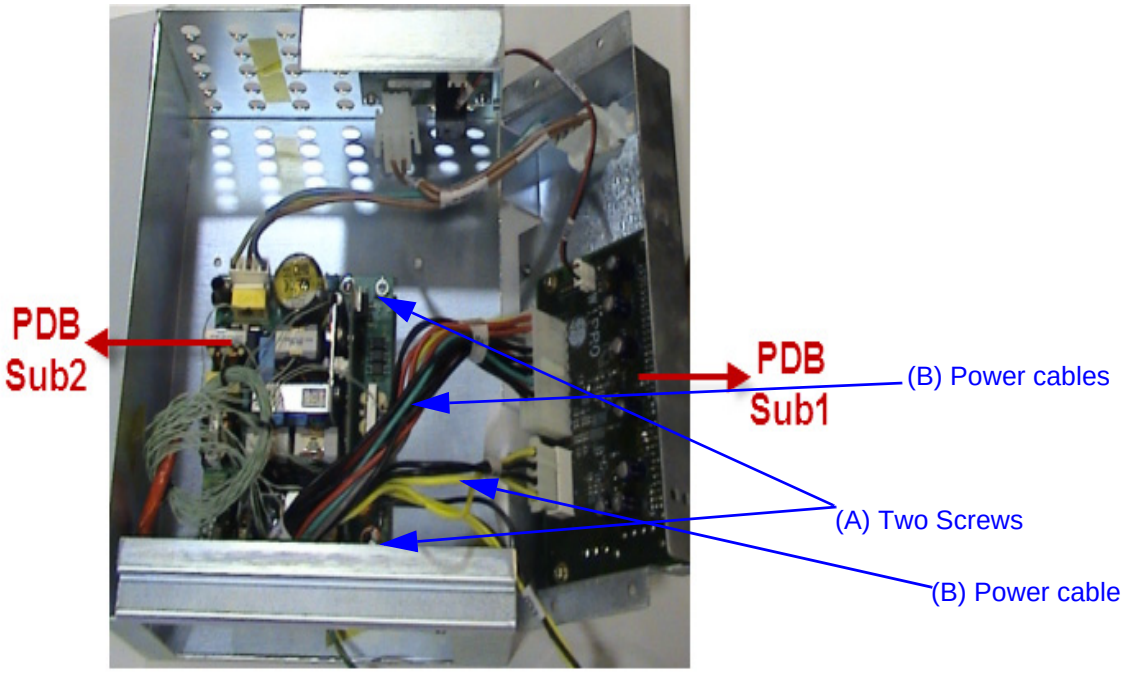


Figure 8-54 Removing Hard Disk Drive Power cable

3) Remove SATA cable from Hard disk drive assembly Refer Figure 8-51 on page 8-47

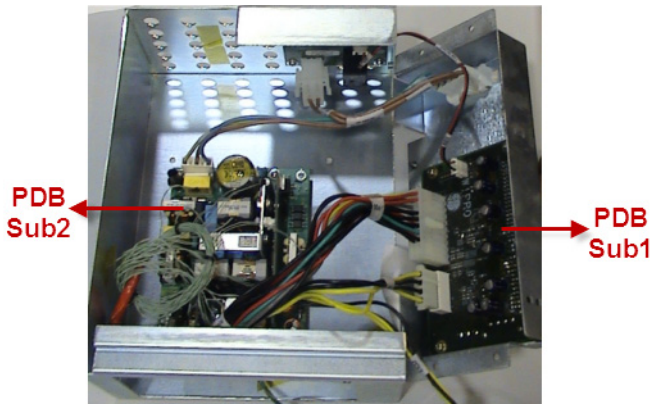


Figure 8-55 Removing Power Distribution Board

8-5-2-5 Mounting procedure

Install the new parts in the reverse order of removal.

8-5-2-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-5-1. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

8-5-3 FAN Assy (FRU No.: 5314414)

8-5-3-1 Tools

Common Philips screwdrivers

8-5-3-2 Needed Manpower

1 person, 15 minutes

8-5-3-3 Preparations

Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-5-3-4 Removal Procedure

To remove MST side FAN

Remove the side cover. Refer section 8-4-2 on page 26 to remove the LH-side cover. Refer Figure 8-39 on page 8-39 to remove the EMI cover and then MST.

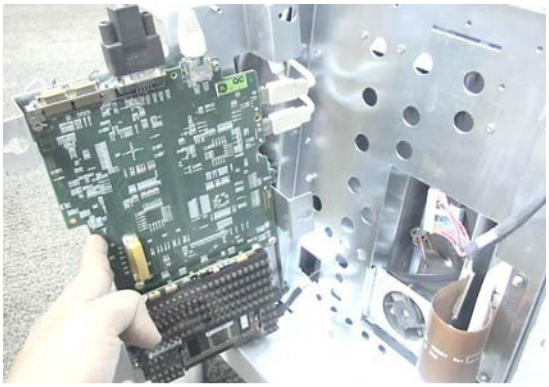


Figure 8-56 MST side FAN

8-5-3-5 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-6-1. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

8-5-4 Rear Panel Assy (110V FRU P/N: 5315503/ 220V FRU P/N: 5315504) - LOGIQ P3 Rear Panel Assy (FRU No. 5368251) - LOGIQ P3BT10

This is a description on how to remove and replace the Rear Panel Assy.

8-5-4-1 Tools

- Common Phillips screwdrivers

8-5-4-2 Needed Manpower

1 persons, 15 minutes

8-5-4-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-5-4-4 Removal Procedure

1) Remove the rear cover . Refer Refer section 8-4-3 on page 27

2) Loosen the Five screws (1,2,3,4) of rear panel assembly of the system. Refer Figure 8-57 on page 8-54

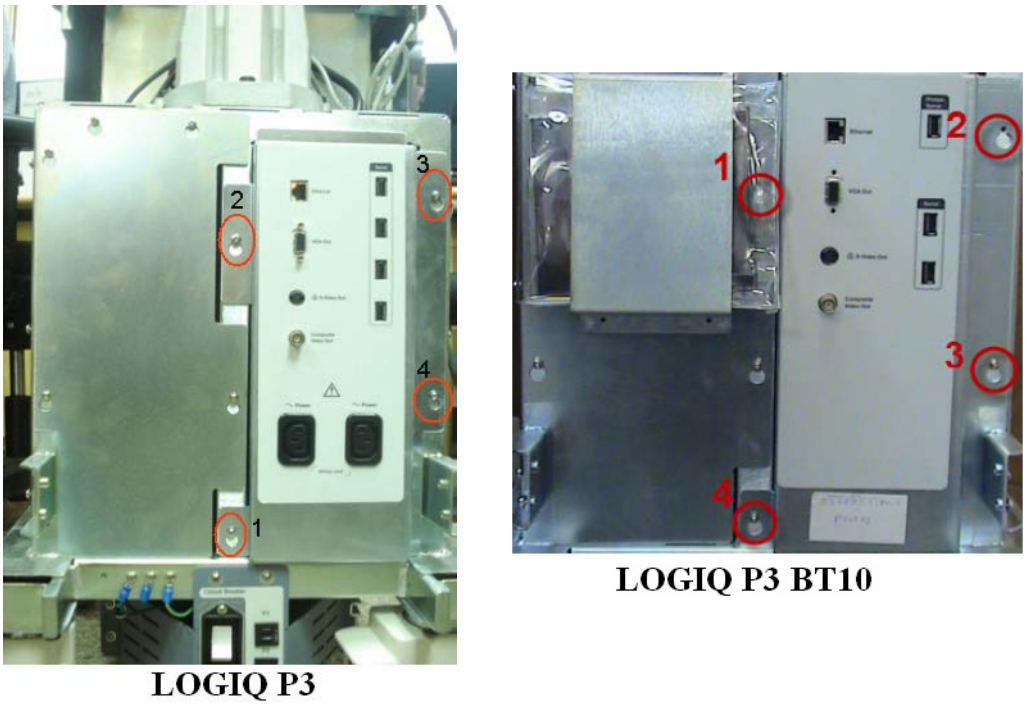


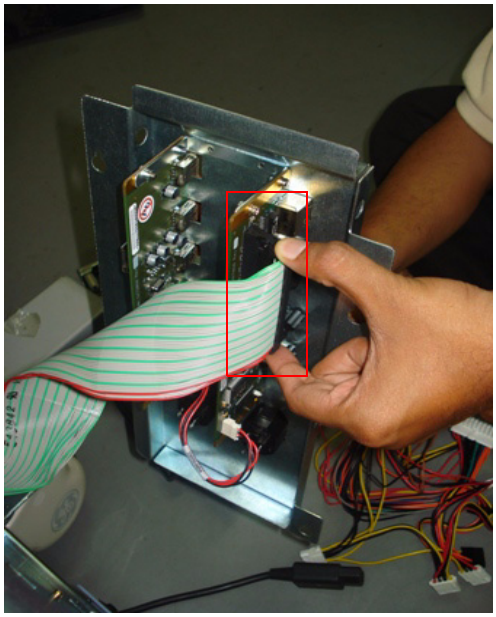
Figure 8-57 Rear pannel Assembly

3) Push upwards & Pull out the Rear panel assembly by the slot marked (A,) in the Figure 8-58 on page 8-55

4) Remove Rear panel assembly from the system Slide upwards as shown below Figure 8-58 on page 8-55

Figure 8-58 Removing Rear panel assembly

5) **LOGIQ P3** - Disconnect the FRC cable, Power cable & USB Cables from rear pannel assembly.



Refer Figure 8-59 on page 8-55

Figure 8-59 Removing FRC & USB cables

8-5-4-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-5-4-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-6-1. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

8-5-5 Connector Board Assy 3PP (FRU No. 5314411) / Connector Board Assy 2PP (FRUNo. 5314412)

This is a description on how to remove and replace the Conn. Board Assy.

8-5-5-1 Tools

- Common Phillips screwdrivers

8-5-5-2 Needed Manpower

- 1 person, 15 minutes

8-5-5-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-5-5-4 Removal Procedure

NOTE: CAUTION

An Electronic discharge may damage a component.turn OFF power and wear the wrist

strap before you remove circuit boards. do not un plug the power card to keep ground continuity.

do not bend or flex the boards when mounting /dismounting each boards surface mount IC boards are

very susceptible to damage from flex/torque.

1) Remove Right cover , Refer Refer section 8-4-1 on page 24 for details on how to remove right cover

2) Remove Left cover , Refer Refer section 8-4-2 on page 26 for details on how to remove right cover

3) Remove Front cover , Refer Refer section Figure 8-28 on page 29 for details on how to remove right cover

4) Loosen Four Screws to remove the connector board and remove the conn board from the system.Refer .Figure 8-60 on page 8-57 .To open the Hinge Door Loosen knob screw(a) & (B)

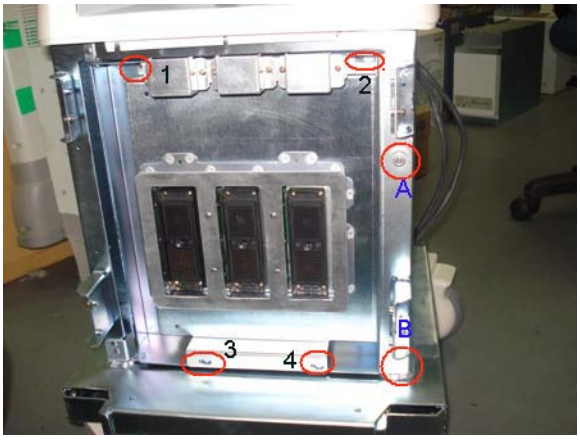


Figure 8-60 Connector Board assembly

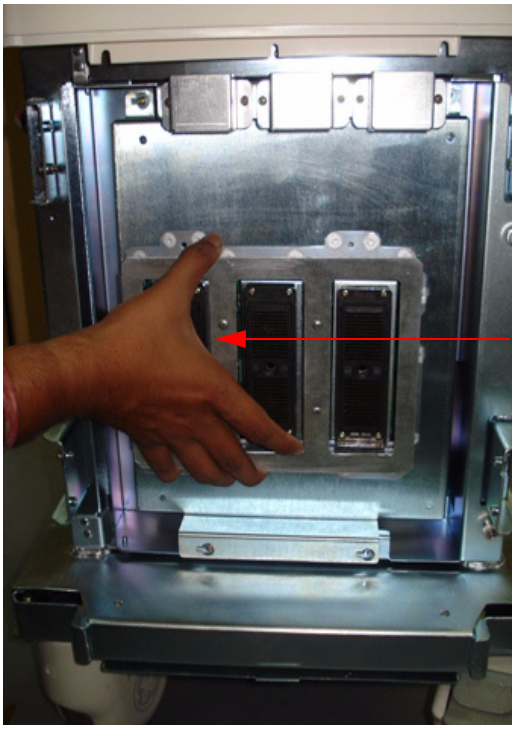


Figure 8-61 Removeing Conn board assembly

5) Remove the conn board TX cable and PDB conn board cable (or power cable).

Refer Figure 8-62 on page 8-58

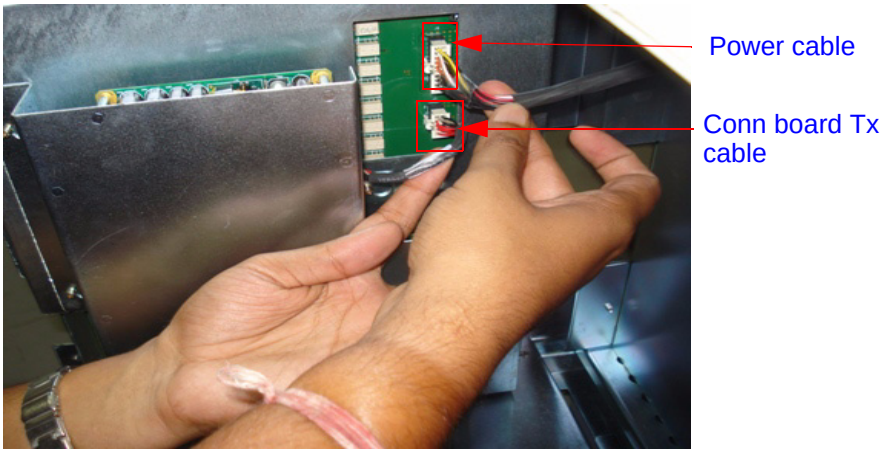


Figure 8-62 Removing Power cable & Conn board Tx cable

6) Loosen two screws (a,b) of flexi cable from conn board to Tx board. Refer Figure 8-63 on page 8-59

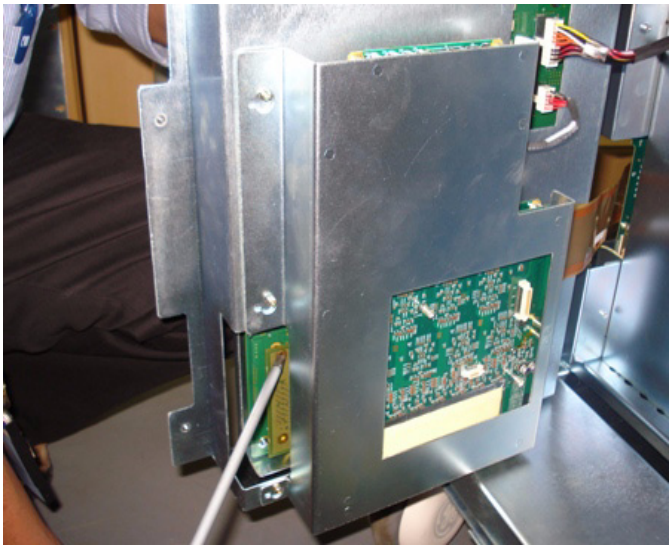


Figure 8-63 Loosen screws of flexi cable

7) Remove flexi cable from conn board to Tx board. Refer Figure 8-64 on page 8-59

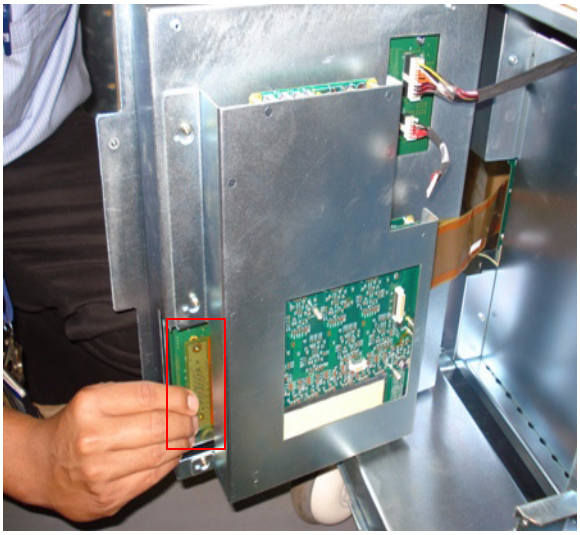


Figure 8-64 Removing Flexi cable conn board

8) Use the screwdriver & remove four screws (1, 2, 3, 4) of connector board from the system.

Refer Figure 8-60 on page 8-57

9) Slide the connector board out.

8-5-5-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-5-5-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-6-2. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	
4-3-7	M Mode Controls	
4-3-8	Color Flow Mode Checks	
4-3-9	Doppler Mode Checks	

8-5-6 TX Board (FRU No. 2404903)/ Flex Cable (Con to Tx) Assy (FRU No.5315108)

This is a description on how to remove and replace the TX Board or Flex cable.

8-5-6-1 Tools

- Common Phillips screwdrivers

8-5-6-2 Needed Manpower

- 1 person, 30 minutes

8-5-6-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-5-6-4 Removal Procedure

1) Remove the connector board assembly.Refer Refer section 8-5-5 on page 57

2) Loosen the Five screws (1,2,3,4,5,) of TX board from the system. Refer Figure 8-65 on page 8-61

3) Remove the Tx board from the system.Refer Figure 8-65 on page 8-61

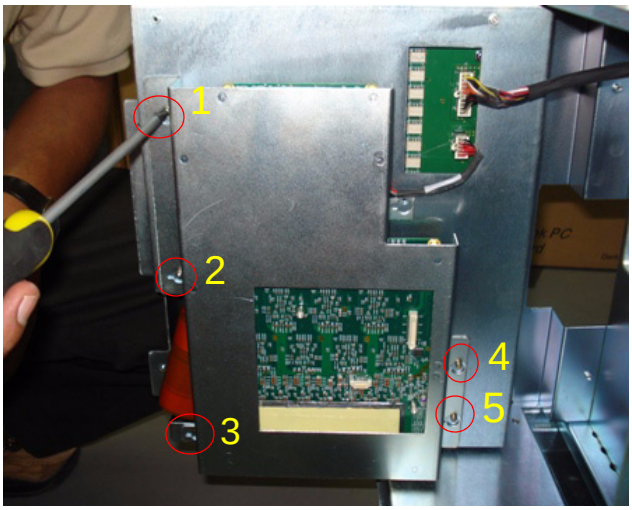
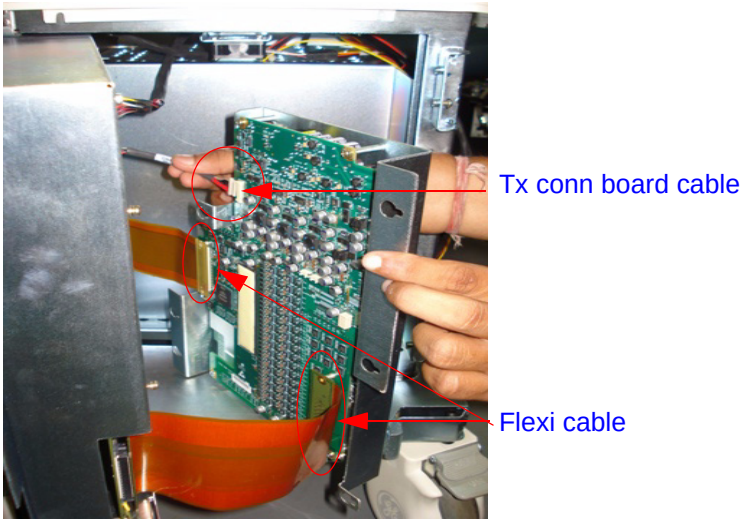


Figure 8-65 TX board Assembly

3) Pull the Tx board from the system as shown below

4) Remove the Tx conn board cable, as shown in figure below

5) Remove the two flexi cable from TX board as shown below



6) To Remove the Flexi cable remove one side fron connector board & other side on TX PWA.

7) To remove the TX, remove the 7 fasteners holding TX to RX as shown in Figure 8-68 on page 8-64

8-5-6-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-5-6-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-6-3. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	
4-3-7	M Mode Controls	
4-3-8	Color Flow Mode Checks	
4-3-9	Doppler Mode Checks	

Section 8-6 RX Board (FRU P/N: 5315027)

8-6-0-1 Tools

- Common Phillips screwdrivers

8-6-0-2 Needed Manpower

- 1 person, 30 minutes

8-6-0-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-6-0-4 Removal Procedure

1) Remove the connector board assembly. Refer section 8-5-5 on page 57

2) Loosen the Five screws (1,2,3,4,5,) of TX board from the system. Refer Figure 8-65 on page 8-61

3) Remove the Tx board from the system. Refer Figure 8-65 on page 8-61

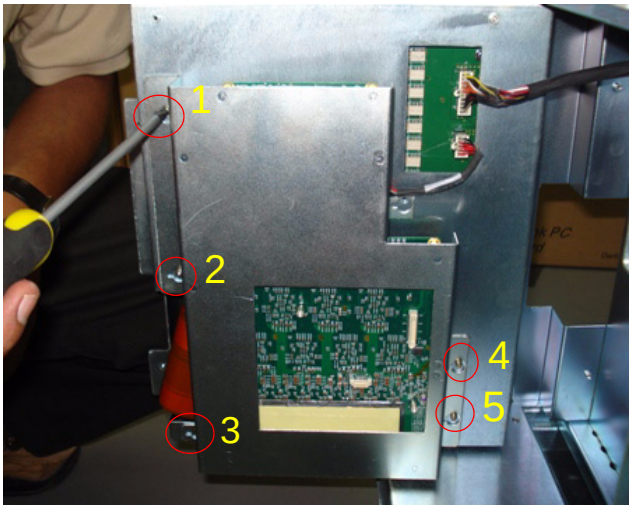


Figure 8-66 TX board Assembly

4) Remove the Tx conn board cable, Refer Figure 8-67 on page 8-64

5) Remove the two flexi cable from TX board as shown below in Figure 8-67 on page 8-64

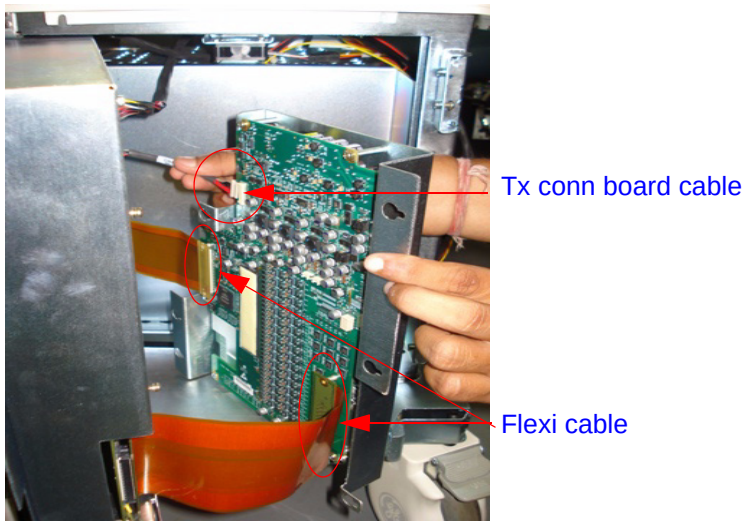


Figure 8-67 Removing TX conn board cable & Flexi cable

6) Remove the Screws fixed in Tx Pwa & seperate the RX PWA from TX PWA as shown in Figure 8-68 on page 8-64

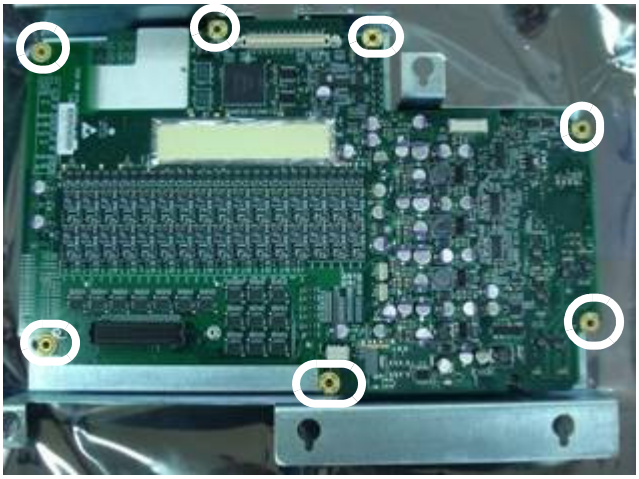


Figure 8-68 Tx-RX combined

8-6-0-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-6-0-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-7-0. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	
4-3-7	M Mode Controls	
4-3-8	Color Flow Mode Checks	
4-3-9	Doppler Mode Checks	

8-6-1 Flexi Cable (MST to TX) Assy (FRU No.5315109)

This is a description on how to remove and replace the TX Board or Flex cable.

8-6-1-1 Tools

- Common Phillips screwdrivers

8-6-1-2 Needed Manpower

- 1 person, 30 minutes

8-6-1-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-6-1-4 Removal Procedure

1) Remove the connector board assembly. Refer section 8-5-5 on page 57

2) Loosen the Five screws (1,2,3,4,5,) of TX board from the system. Refer Figure 8-65 on page 8-61

3) Remove the Tx board from the system. Refer Figure 8-65 on page 8-61

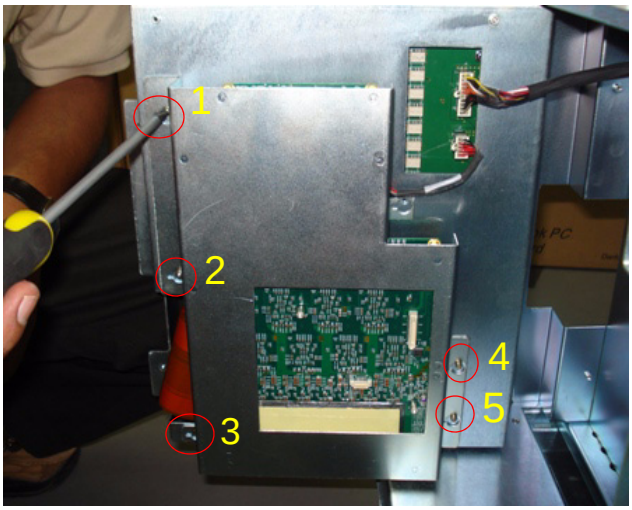


Figure 8-69 TX board Assembly

3) Pull the Tx board from the system.as shown below Figure 8-66 on page 8-63

4) Remove the Tx conn board cable. Refer Figure 8-67 on page 8-64

5) Remove the two flexi cable from TX board as shown below in Figure 8-70 on page 8-67

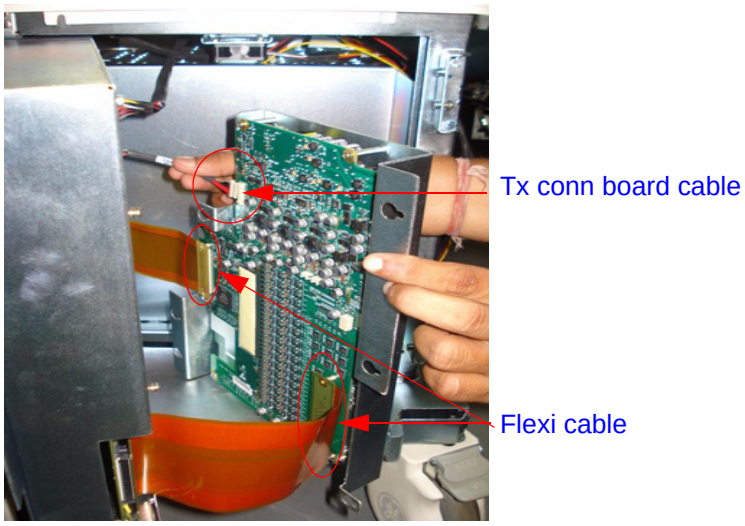


Figure 8-70 Removing TX conn board cable & Flexi cable

6) To Remove the Fex cable remove one side fron connector board & other side on TX PWA.

7) Use screwdriver to remove the screws of MST to TX flexi cable and remove the core. Refer Figure 8-71 on page 8-67

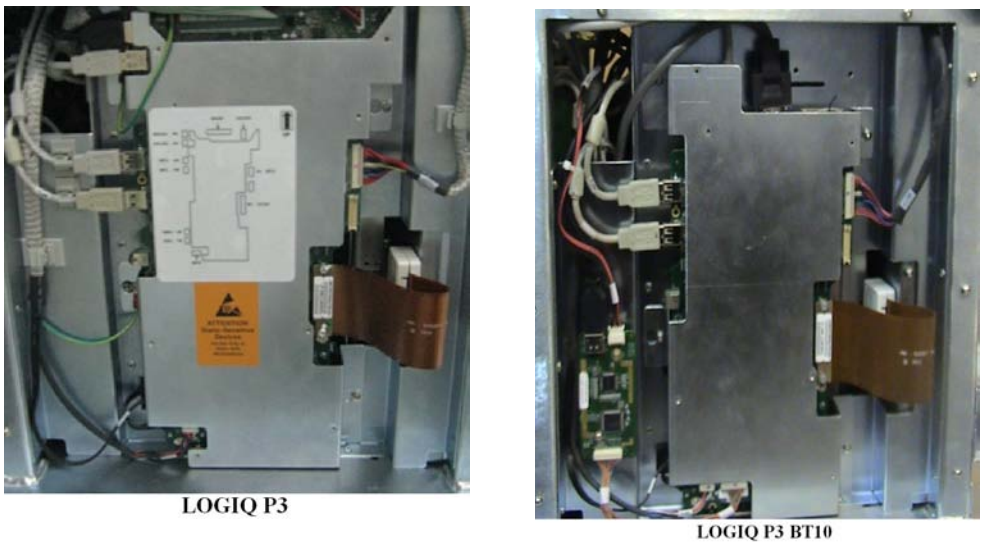


Figure 8-71 Removing Flexi cable of MST board

8-6-1-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-6-1-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-7-1. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	
4-3-7	M Mode Controls	
4-3-8	Color Flow Mode Checks	
4-3-9	Doppler Mode Checks	

NOTE: ***LOGIQ P3 BT10*** *- For the circuit breaker, there is 4 amps FUSE, 2 no.s FUSE for each neutral and line.*

Section 8-7 Power Block - LOGIQ P3

8-7-1 Transformer Assembly (FRU No. 5196448) Cable Guard Clamp (FRU No:5219747)

This is a description on how to remove and replace the Transformer Assy.

8-7-1-1 Tools

- Common Phillips screwdrivers

8-7-1-2 Needed Manpower

- 1 persons, 15 minutes

8-7-1-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

NOTE: For 110V System Configuration use 110V wired Plug (with 3 Amps Fuse).

NOTE: For 230V System Configuration use 230V Wired plug (With 2 Amps Fuse).

NOTE: To replace Cable Guard Clamp Donot remove the transformer,remove power cord and press the cable clamp from both the sides the clamp will come out side.

8-7-1-4 Removal Procedure

1) Remove rear cover. Refer section 8-4-3 on page 27

2) Unscrew two screws (a,b) as marked in Figure 8-72 on page 8-69

3) Remove GND cable (which ever connected near to “a”). Refer Figure 8-72 on page 8-69

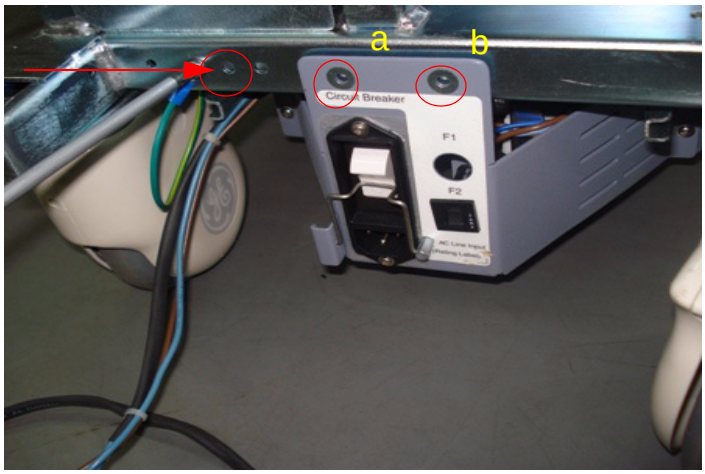


Figure 8-72 Removing Transformer Assembly

4) Pull out the transformer tray assembly from the system. Refer Figure 8-73 on page 8-70

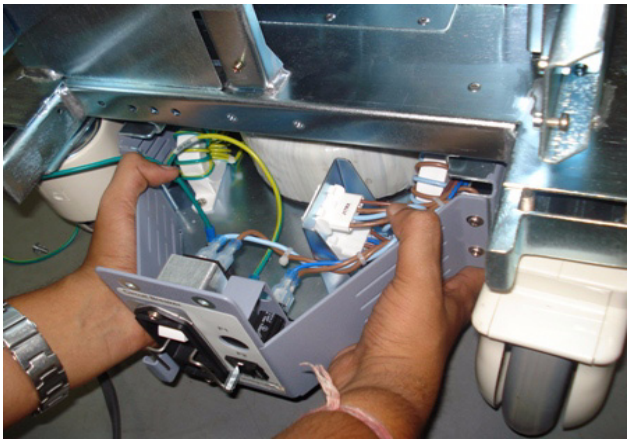


Figure 8-73 Removing Tansformer Assembly

5) Pull out the transformer tray so the connector marked J4 is accessible and disconnect cable.

Refer Figure 8-74 on page 8-70

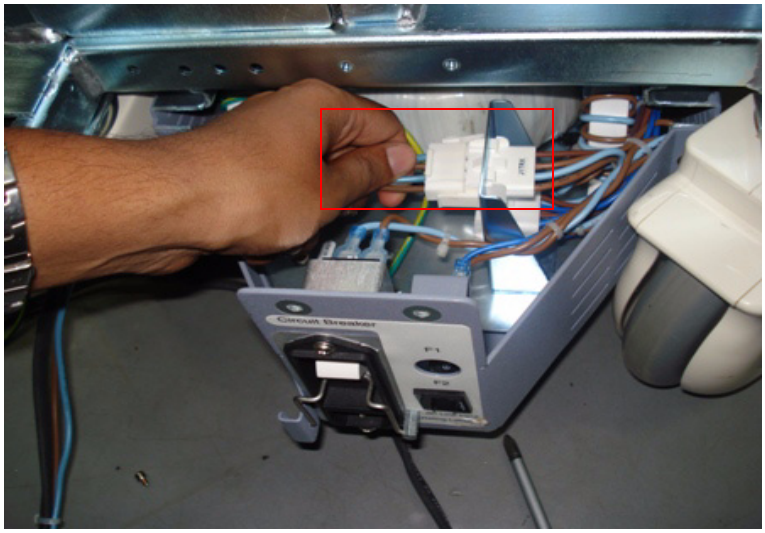


Figure 8-74 Removing Transformer cable

8-7-1-5 Mounting procedure

1.) Install the transformer assy in the reverse order of removal.

8-7-1-6 Functional Checkout Procedure

See Section	Functional and/or Leakage Current Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-8-1. Leakage Current measured at {----------}. Equipment passes all required tests and is ready for use..
4-3-2	Power Off/ Shutdown	
10-7-5	Chassis Leakage Current Test	

8-7-2 Power Block - LOGIQ P3 BT10

8-7-3 Power Entry Module (FRU No: 5397502) Cable Guard (FRU No: 5389807)

This is a description on how to remove and replace the Transformer Assy.

8-7-3-1 Tools

- Common Phillips screwdrivers

8-7-3-2 Needed Manpower

- 1 persons, 15 minutes

8-7-3-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-7-3-4 Removal Procedure

1) Remove rear cover. Refer section 8-4-3 on page 27. To remove the rear cover, remove the side covers.

2) Unscrew two screws (a,b) as marked in Figure 8-72 on page 8-69

3) Remove GND cable (which ever connected near to “a”). Refer Figure 8-72 on page 8-69

Figure 8-75 Removing Transformer Assembly

4) Pull out the transformer tray assembly from the system. Refer Figure 8-73 on page 8-70

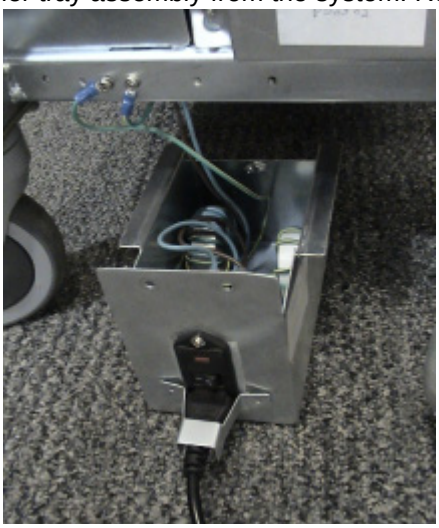


Figure 8-76 Removing Tansformer Assembly

8-7-3-5 Mounting procedure

Install the transformer assy in the reverse order of removal.

8-7-3-6 Functional Checkout Procedure

See Section	Functional and/or Leakage Current Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-8-1. Leakage Current measured at {----------}. Equipment passes all required tests and is ready for use..
4-3-2	Power Off/ Shutdown	
10-7-5	Chassis Leakage Current Test	

Section 8-8Key Caps (FRU P/N: 5315124)

8-8-0-1 **Tools**

- Common Phillips screwdrivers

8-8-0-2 Needed Manpower

- 1person, 15 minutes

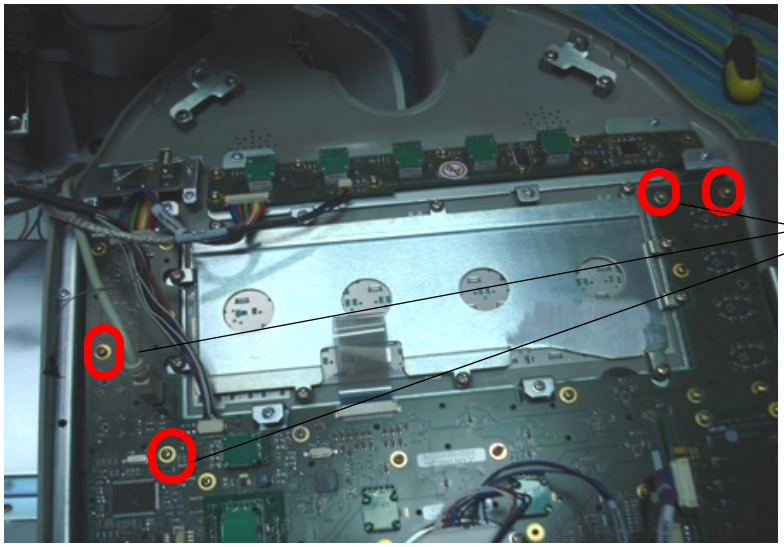
8-8-0-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-8-0-4 Removal Procedure

1) Remove the Keyboard assembly. Refer section 4-2-1.

2) Remove 24 screws shown in figure below and seperate the Keyboard PWA.



3) Push the key cap out from the rear side and remove it.

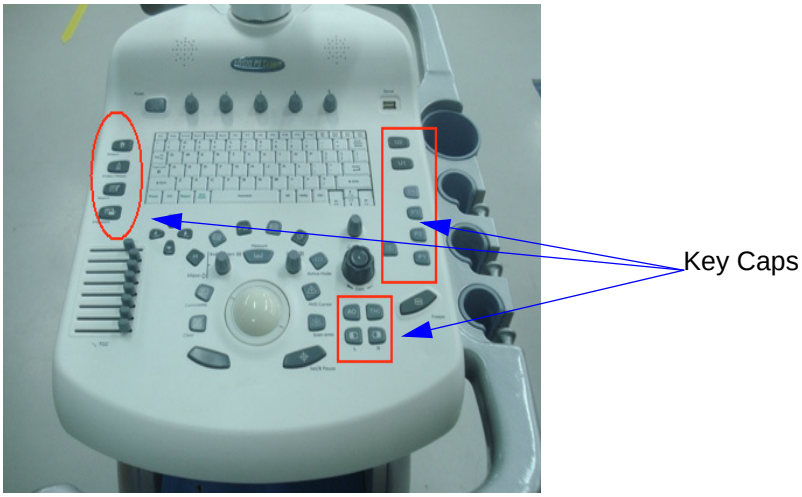


Figure 8-77 Top View of Key Caps

8-8-0-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-8-0-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-9-0. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

Section 8-9DVD Drive

8-9-1 DVD Tray Assembly (FRU P/N:) / DVD Drive (FRU P/N: 5312274)

This is a description on how to remove and replace the CD Tray Assembly.

8-9-1-1 Tools

- Common phillips screwdrivers

8-9-1-2 Needed Manpower

- 1person, 15 minutes

8-9-1-3 Preparations

Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-9-1-4 Removal Procedure

1) Loosen two screws and Remove the DVD tray assembly. Refer Figure 8-78 on page 8-76

2) Disconnect the cables connected to the DVD drive.

3) Remove the DVD drive from the DVD tary by removing the four screws holding it. Refer Figure 8-78 on page 8-76

Figure 8-78 Removal CD drive Assembly

8-9-1-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-9-1-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-10-1. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

Section 8-10 Power Cable

8-10-0-1 **Tools**

- None

Part Number	Description
5337332	Power Cord India
5248395	Power Cord China
5248396	Power cable Europe
5248393	Power cable Japan
5248394	Power cable America
5390874	Power cable Brazil
5398510	Power cable Israel
5182816	Power Cord UK/HK
5182940	Power Cord Italy
5182083	Power Cord Denmark
5182235	Power Cord Switzerland

8-10-0-2 Needed Manpower

- 1person, 15 minutes

8-10-0-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-10-0-4 Removal Procedure

1. Pull the metal clamp upwards.

2. Remove the power cable as shown in the Figure below.

LOGIQ P3

LOQIQ P3 BT10

Figure 8-79 Power Cable

8-10-0-5 Mounting procedure

1.) Install the new parts in the reverse order of removal.

8-10-0-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-11-0. Leakage Current measured at {----------}. Equipment passes all required tests and is ready for use..
4-3-2	Power Off/ Shutdown	
10-7-5	Chassis Leakage Current Test	

Section 8-11 Video Interface Board

8-11-0-1 Tools

Common Philips screwdrivers

8-11-0-2 FRU BOM

This FRU part comes along with the two screws

8-11-0-3 Needed Manpower

1 person,

8-11-0-4 Preparation

Shutdown the system and switch off the main Circuit Breaker at the bottom of the rear side of the system.

8-11-0-5 Removal Procedure

Remove the left side cover (Refer 8-4-2 on page 8-26) and remove the EMI cover (Refer 8-4-9 on page 8-39).

In the Video Interface Board, unscrew the two screws and remove all the cables connected to that board.

8-11-0-6 Mounting Procedure

Install the new parts in the reverse order of removal.

8-11-0-7 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-2-3. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

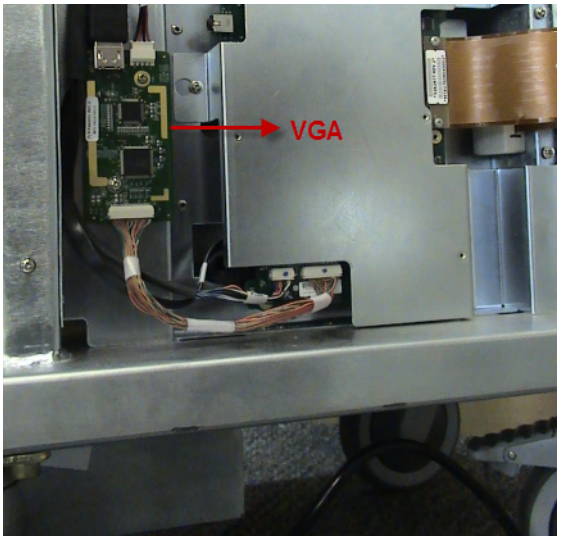


Figure 8-80 Video Interface Board

Section 8-12 Signal Cable Set (FRU P/N: 5315042)

8-12-0-1 Tools

- Common Phillips screwdrivers

8-12-0-2 FRU BOM

This FRU Kit P/N: 5315042 consists of following parts.

Note:This individual cables are not seperate FRUs, but are part of cable kit higher level FRU

Table 8-1 LOGIQ P3

Part Numbers	Description
5272230	Real panel Interface cable assembly
5265925	LCD signal Cable
5262402	Docking Brd to Speaker
5273129	SATA signal Cable for HDD
5266424	Keyboard ground Cable
5272618	Fan Cable Assembly
5269755	TGC Interface Cable
5268980	Track ball 4 pin interface
5264458	Track ball 6 pin interface
5267353	Encoder PCB 15 pin interface

Table 8-2 LOGIQ P3 BT10

Part Numbers	Description
5265925	LCD signal Cable
5262402	Docking Brd to Speaker
5273129	SATA signal Cable for HDD
5266424	Keyboard ground Cable
5269755	TGC Interface Cable
5268980	Track ball 4 pin interface
5264458	Track ball 6 pin interface
5267353	Encoder PCB 15 pin interface
5342787	VGA cable assembly
5342788	Video Interface to MST board Cable assembly
5342786	Ethernet Cable assembly

8-12-0-3 Needed Manpower

- 1 persons, 15 minutes per cable

8-12-0-4 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-12-0-5 Removal Procedure

1. Remove the covers and parts as applicable. Refer to the applicable section of this document.

2. Unplug the signal cable from both the ends.

8-12-0-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-12-0. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

Section 8-13 Power Cable Set (FRU P/N: 5315036)

8-13-0-1 Tools

- Common Phillips screwdrivers

8-13-0-2 FRU BOM

This FRU Kit P/N:5315036 consists of following parts.

Note: This individual cables are not seperate FRUs, but are part of cable kit higher level FRU.

Table 8-3 LOGIQ P3

Part Number	Description
5270783	Cable Assembly for Transformer to PS, SSR and Peripheral Connector
5262720	Cable Assembly for Panel mount connector to power supply & solid state relay
5262046	Peripheral Connector to Rear panel sockets
5269059	PDB to Conn Brd and MST Brd
5269791	LCD Power cable
5269919	Dual SATA Power Cable for PDB to HDD and DVD
5270870	PDB to KBD and Fan
5269067	Conn Brd to TXB
5263747	Docking Brd to RP2 FRC cable
5263844	MST to KBD & DVD SATA Signal cable

Table 8-4 LOGIQ P3 BT10

Part Number	Description
5342775	Cable Assembly: 1 Power entry to PS, Relay and Printer
5342780	Power Assembly to Power supply and Relay Card_Cable assembly
5342888	PDB to Conn Brd, MST Brd and RP2 BRD_Cable Assembly
5366298	LCD DC Power cable
5269919	Dual SATA Power Cable for PDB to HDD and DVD
5270870	PDB to KBD and Fan
5269067	Conn Brd to TXB
5263844	MST to KBD & DVD SATA Signal cable
5342783	Power Supply output to PDB
5390435	POWER_SUPPLY_FAN_CABLE_ASSEMBLY
5342782	Cable assembly: 4 PDB to SBV board

8-13-0-3 Needed Manpower

- 1 persons, 15 minutes per cable

8-13-0-4 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

8-13-0-5 Removal Procedure

1. Remove the covers and parts as applicable. Refer to the applicable section of this document.

2. Unplug the power cable from both the ends.

8-13-0-6 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Rev 2, Section 8-13-0. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	

8-13-1 CWD Assy (FRU No: 5315026)

Purpose: This is a description on how to remove and replace the CWD Assy.

8-13-1-1 Tools

- Common phillips screwdrivers
- Allen/Unbraco wrench

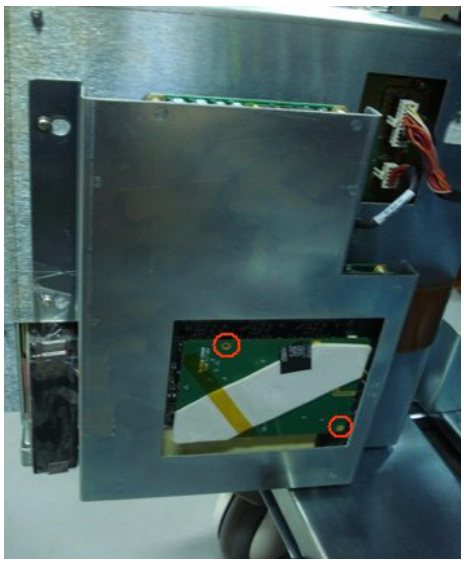
8-13-1-2 Needed Manpower

- 1 person, 30 minutes + travel

8-13-1-3 Preparations

- Shutdown the system and switch off the main Circuit Breaker at the bottom rear side of the system.

Figure 8-81 Removal Procedure of cwd Refer to 8-13-1 on page 8-84 .



1.) Unscrew two screws(1-2).
2.) Disconnect the CWD assy.

8-13-1-4 Removal procedure

Refer to 8-13-1 on page 8-84 .

1.) Unscrew two screws (1-2) to remove the CWD cover. see 8-13-1 on page 8-84]
2.) Connect the CWD assy to RX64. [See 8-13-1 on page 8-84]
3.) Press the CWD assy tightenedly, refer to 8-13-1 on page 8-84 .
4.) Screw two screws (1-2) to fix the CWD assy on RX64 assy., see 8-13-1 on page 8-84]

8-13-1-5 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-13-15. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	
4-3-7	M Mode Controls	
4-3-8	Color Flow Mode Checks	
4-3-9	Doppler Mode Checks	

Section 8-14
Loading Base Image Software

LOGIQ P3 - FRU part num for Base Image software.

1.) 5308912-3 Logiq P3 Application Software with Base Image for Expert.
2.) 5315328-3 Logiq P3 Application Software with Base Image for BW.
3.) 5315327-3 Logiq P3 Application Software with Base Image for Pro.

LOGIQ P3 BT10 - FRU part num for Base Image software.

1.) 5308912-2 Logiq P3 Application Software with Base Image for Expert.
2.) 5315328-2 Logiq P3 Application Software with Base Image for BW.
3.) 5315327-2 Logiq P3 Application Software with Base Image for Pro.

NOTE: While it is believed to be unnecessary, It would not hurt to disconnect the system from the network and remove all transducers.

NOTE: To Enter BIOS Press F2 (Arrow) Key immediately after power on and enter BIOS Password for LP3 as lakshya.

NOTE: Please ensure AC adapter is connected during system upgrade!

1.) Before loading the Software Backup the database for reference see 4-3-14-2 on page 4-28 and after loading the Software Restore the bacup database.
2.) Insert the disk labeled “System & Application Software” into the DVD drive.
3.) Properly turn off the scanner by momentarily pressing the *Power On/Off* Switch. Select “Shutdown” from the System Exit menu.
4.) If the system will not shutdown normally, hold down the *Power On/Off* Switch until the light turns from green to amber.

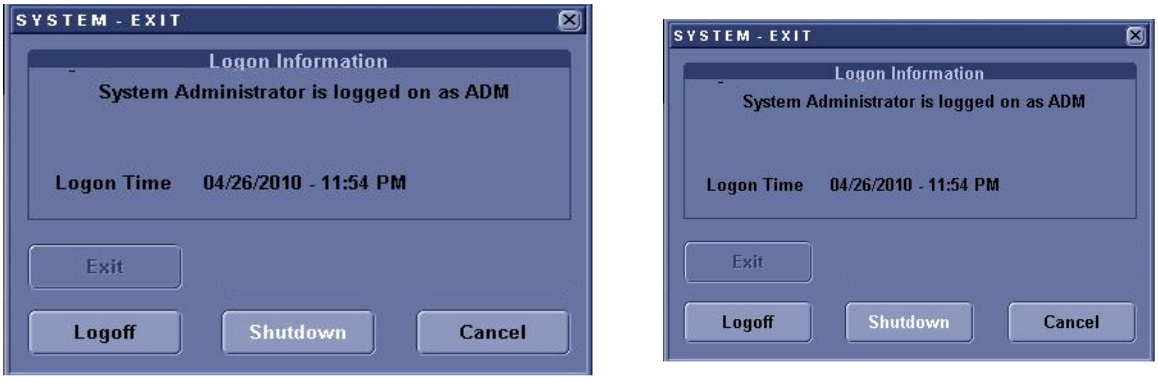


Figure 8-82 Shutdown Dialog Box

5.) Turn on the scanner. System will detect the DVD-RW automatically.

6.) Press any key to continue when below message display as shown in Figure 8-83 on page 8-87 .

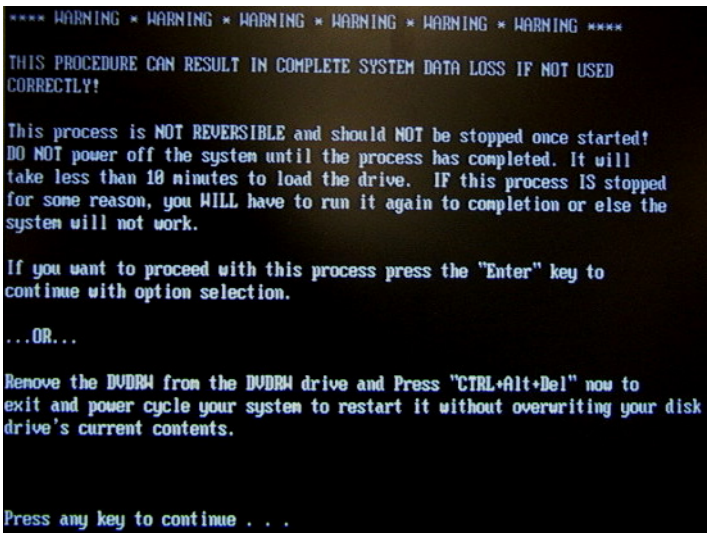

**** WARNING * WARNING * WARNING * WARNING * WARNING * WARNING ****
THIS PROCEDURE CAN RESULT IN COMPLETE SYSTEM DATA LOSS IF NOT USED CORRECTLY!
This process is NOT REVERSIBLE and should NOT be stopped once started! DO NOT power off the system until the process has completed. It will take less than 10 minutes to load the drive. IF this process IS stopped for some reason, you WILL have to run it again to completion or else the system will not work.
If you want to proceed with this process press the "Enter" key to continue with option selection.
...OR...
Remove the DVDRW from the DVDRW drive and Press "CTRL+Alt+Del" now to exit and power cycle your system to restart it without overwriting your disk drive's current contents.
Press any key to continue . . .

Figure 8-83 Update message

7.) Select one of the options for loading the system. Select choice [a] to load the complete disk. Refer to Figure 8-84 on page 8-87 .

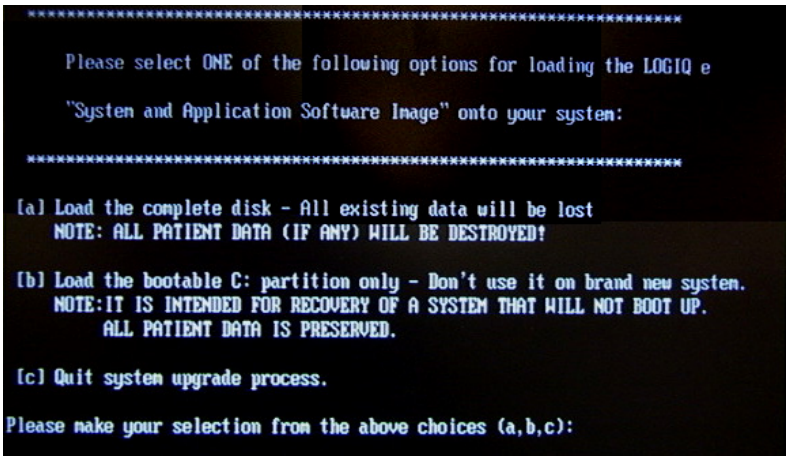

Please select ONE of the following options for loading the LOGIQ e
"System and Application Software Image" onto your system:
[a] Load the complete disk - All existing data will be lost
NOTE: ALL PATIENT DATA (IF ANY) WILL BE DESTROYED!
[b] Load the bootable C: partition only - Don't use it on brand new system.
NOTE:IT IS INTENDED FOR RECOVERY OF A SYSTEM THAT WILL NOT BOOT UP.
ALL PATIENT DATA IS PRESERVED.
[c] Quit system upgrade process.
Please make your selection from the above choices (a,b,c):

Figure 8-84 Selection for loading the system

WARNING ***While the software install procedure is designed to preserve data, you should select choice [b] to format disk C only.***

8.) Press “Yes” or “No” to continue.

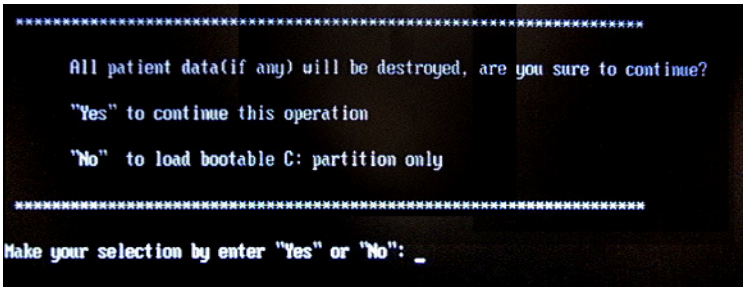

All patient data(if any) will be destroyed, are you sure to continue?
"Yes" to continue this operation
"No" to load bootable C: partition only
Make your selection by enter "Yes" or "No": _

Figure 8-85 Confirmation on loading the system

9.) System DVD will be loaded as shown in Figure 8-86

10.) .Once the software is completely loaded, a message will be displayed as shown in Figure 8-87.

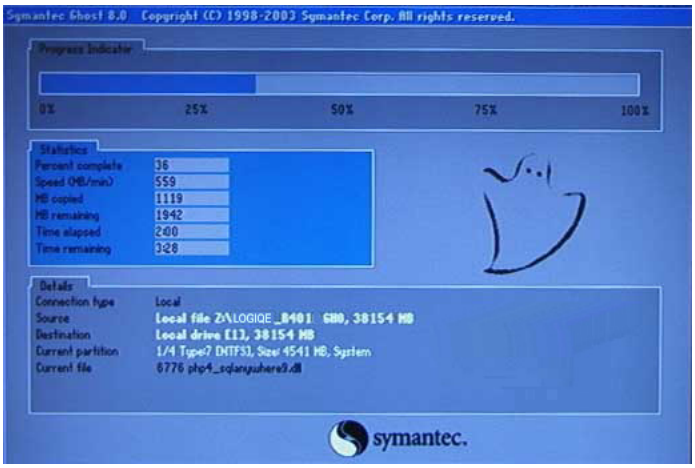


Figure 8-86 System CD loading

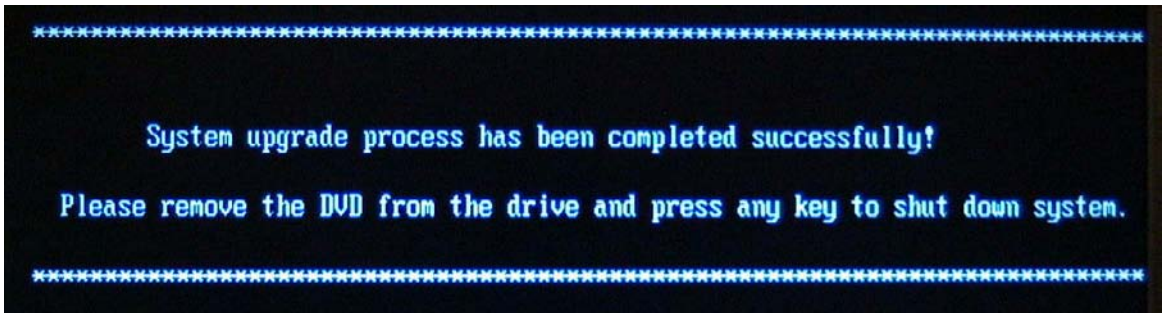

System upgrade process has been completed successfully!
Please remove the DVD from the drive and press any key to shut down system.

Figure 8-87 System upgrade complete

11.) Remove the DVD from the system and reboot. Enter the system serial number and option key.

8-14-0-1 Initiate Software reload from the Common Service Desktop

Figure 8-88 Windows start

1.) Log on to the Common Service Desktop as GE Service. It requires the rotating security password.

2.) Select Utilities.

3.) Select Invoke SW Reload. This brings up the dialog as shown in the below figure.

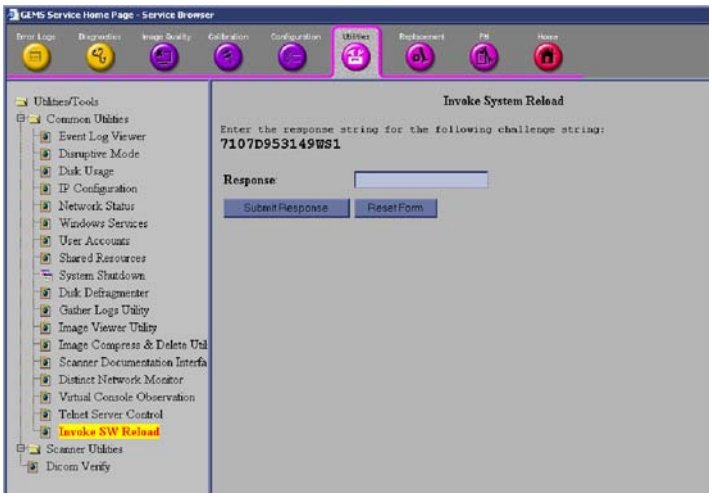


Figure 8-89 Invoke SW Reload

4.) Call the Online Center (OLC).

Tell the OLC that you need a “Challenge Code”, and on request, you must read the challenge string on the screen. OLC will return a password that you need to type in as the Response.

5.) Enter the Response (password) you received from OLC.

From the repository, the System Software reloading starts. The “Reload system setup successful. Reboot system to begin SW reload” screen appears.

6.) Reboot the system either manually or through “System Shutdown” under Common Utilities.

8-14-0-2 Initiate software reload from the Recovery Console

Ensure that the LOGIQ P3 is powered down.

1.) Press the power on button on the keyboard. The LOGIQ P3 starts.

2.) Press the Esc button on the alphanumeric keyboard multiple times until the GE screen appears. Then continuously press the Esc button until the blue color progress bar is seen on the screen as shown below.

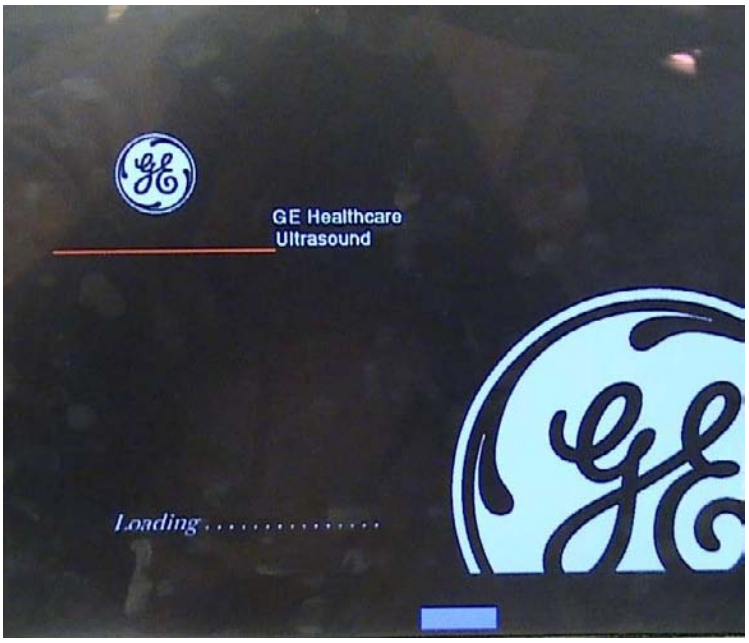


Figure 8-90 GE screen with progress bar

3.) The GRUB menu screen appears. On the GRUB menu, select Recovery Console.

The GE Healthcare Recovery Console is displayed. Enter the password.

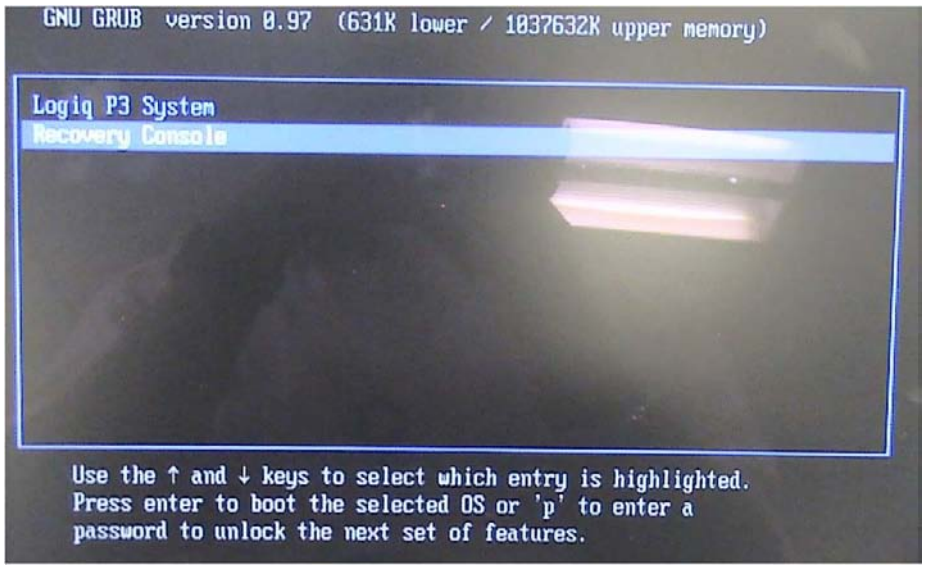

GNU GRUB version 0.97 (631K lower / 1037632K upper memory)
Logiq P3 System
Recovery Console
Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS or 'p' to enter a
password to unlock the next set of features.

Figure 8-91 GRUB menu

4.) Call the Online Center (OLC).

Tell the OLC that you need a “Challenge Code”, and on request, you must read the challenge string on the screen. OLC will return a password that you need to type in as the Response.

5.) Enter the Response (password) you received from OLC. The System Software loading from the repository starts.

After the Software loading is complete, restore the Backed up Database.

8-14-0-3 Functional Checkout Procedure

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-14-0. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	
4-3-7	M Mode Controls	
4-3-8	Color Flow Mode Checks	
4-3-9	Doppler Mode Checks	

8-14-1 For a service call with no fru replacement, use the following debrief script.

See Section	Functional Test	Debrief Script
4-3-1	Power On/Boot Up	Service Manual Direction 5308917-100, Section 8-14-1. Equipment passes all required tests and is ready for use.
4-3-2	Power Off/ Shutdown	
4-3-6	B Mode Checks	
4-3-7	M Mode Controls	
4-3-8	Color Flow Mode Checks	
4-3-9	Doppler Mode Checks	

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Chapter 9
Renewal Parts

Section 9-1
Overview

9-1-1 Purpose of Chapter 9

This chapter gives you an overview of Spare Parts available for the LOGIQ P3.

Table 9-1 Contents in Chapter 9

Section	Description	Page Number
9-1	Overview	9-1
9-2	List of Abbreviations	9-2
9-3	Operator Console Assy	9-3
9-4	LCD Assy	9-4
9-5	Keyboard Assy	9-5
9-6	Mechanical Assy	9-8
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9-8	Flex PCB Cables	9-13
9-9	Signal Cable Set	9-14
9-10	USB Cable set	9-16
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9-12	Accessories and Kits	9-19
9-13	Probe	9-21
9-14	Logiq P3 FRU List With Part Numbers	9-22

Section 9-2
List of Abbreviations

- Assy - Assembly
- Ctrl - Control
- FRU 1 - Replacement part available in part hub
- KBD - Keyboard
- LCD - Liquid Crystal Display
- BnV - Brightness and Volume
- RX64- Front Processor Board
- TMST - Master Board
- TX64 - Transmit Board
- PDB- Power Distribution Board

Section 9-3
Operator Console Assy

Figure 9-1 OPERATOR CONSOLE ASSY

1.) Peripheral Device (Signals I/O Port, Power In)
2.) Three Probe Port
3.) ECG
4.) DVD-RW Drive
5.) Monitor
6.) USB Port
7.) B/W Printer Option
8.) Probe Holder
9.) Gel Holder
10.) VGA Connector
11.) Ethernet Connector
12.) S Video Connector
13.) BNC Connector
14.) USB Ports
15.) Circuit Breaker
16.) Power connector

Section 9-4
LCD Assy

100

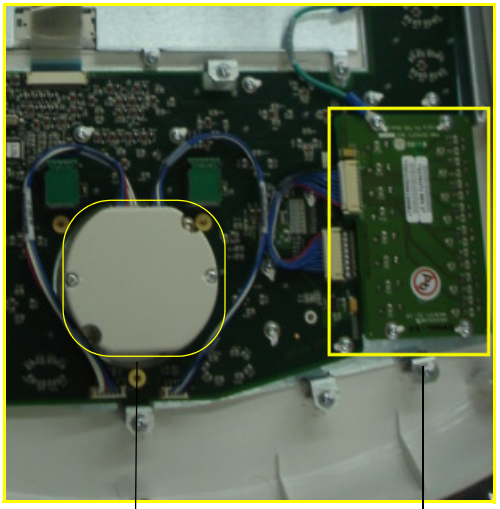
Figure 9-2 LCD Assy

Table 9-2 LCD Assy

Item	Part Name	Description	Quantity
100	5311512 (LP3)	LCDMON II	1
	5396925 (LP3 BT10)		1

Section 9-5
Keyboard Assy

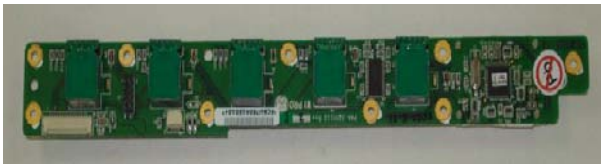
200



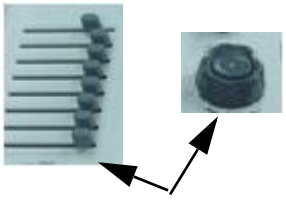
203

202

201



204



205

Figure 9-3 Keyboard Assy

Section 9-5 Keyboard Assy (cont'd)

Table 9-3 Keyboard Assy

Item	Part Name	Part Number	Description	Quantity
200	Keyboard Assy	5314404	Keyboard Assy	1
201	A/N Keyboard Assy	5315106	A/N Key Assy	1
202	TGC Assy	5315107	TGC	1
203	TB Assy	5315029	TB Assy	1
204	NTPUI Encoder PWA Asm	5316731	NTPUI Encoder PWA Asm	1
205	Knob set	5315502	TGC knob, Gain knob	1 each

9-5-1 Keyboard key caps FRU part no:- 5315124

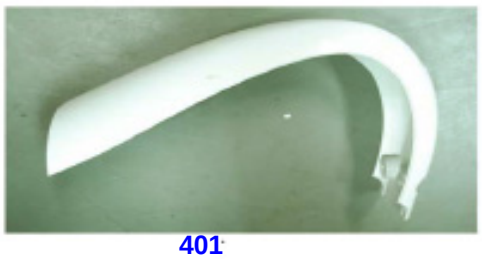
Figure 9-4

Table 9-4 Keyboard Key caps

Item	Part Number	Description	Quantity
301	5310049	Patient_Key_Lakshya	1
302	5310050	Power_Key_Lakshya	1
303	5310051	Probe_Key_Lakshya	1
304	5310052	Report_Key_Lakshya	1
305	5310053	End_Exam_Key_Lakshya	1
306	5310054	Menu_Key_Lakshya	1
307	5310055	M_Key_Lakshya	1
308	5310056	CW_Key_Lakshya	1

Item	Part Number	Description	Quantity
309	5310057	PW_Key_Lakshya	1
310	5310059	PDI_Key_Lakshya	1
311	5310060	CF_Key_Lakshya	1
312	5310061	Active_Key_Lakshya	1
313	5310062	Select_Key_Lakshya	1
314	5310063	Clear_Key_Lakshya	1
315	5310064	Comment_Key_Lakshya	1
316	5310065	Measure_Key_Lakshya	1
317	5310066	Cursor_Key_Lakshya	1
318	5310067	Scan_Area_Key_Lakshya	1
319	5310068	Set_Key_Lakshya	1
320	5310069	Auto_Key_Lakshya	1
321	5310070	Harmonic_Key_Lakshya	1
322	5310071	LH_Key_Lakshya	1
323	5310072	RH_Key_Lakshya	1
324	5310073	Reverse_Key_Lakshya	1
325	5310074	User1_Key_Lakhsya	1
326	5310075	User2_Key_Lakshya	1
327	5310076	P4_Key_Lakshya	1
328	5310077	P3_Key_Lakshya	1
329	5310078	P2_Key_Lakshya	1
330	5310079	P1_Key_Lakshya	1
331	5310080	Freeze_Key_Lakshya	1

Section 9-6Mechanical Assy



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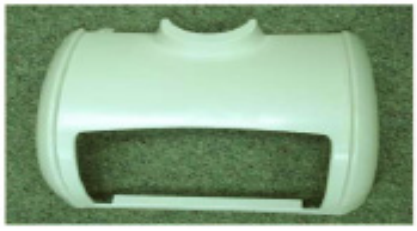

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Figure 9-5 Mech Assy

Section 9-6 Mechanical Assy (cont'd)

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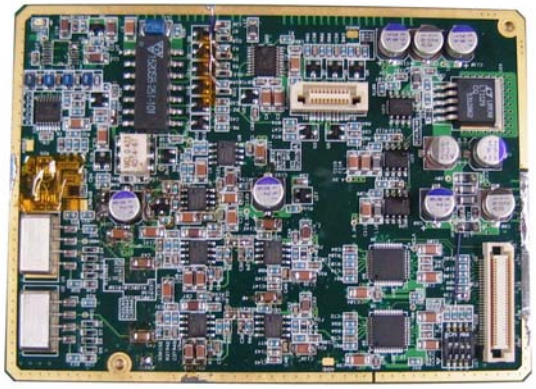
Figure 9-6 Mech Assy

Table 9-5 Mech assembly

Item	Part Name	Part Number	Description	Quantity
401	ARM Cover	5310093	ARM Cover	1
402	Keyboard Rear cover Assy	5315122	Keyboard Rear cover Assy	1
403	Right cover (A) & Left cover (B)	5315114 & 5315115	Right cover (A) & Left cover (B)	1
404	Top Cover Assy	5315121	Top Cover	1
405	Probe & Gelbottle holder	5313573	Probe & Gelbottle holder	1
406	Rear cover	5315117	Rear cover	1
407	Front cover	5315116	Front cover	1
408	Rear EMI Cover	5315111	EMI Cover Set	1
409	RPA 230V & RPA 100V (P3)	5313708	Rear Panel ASSY -100V / 220V	1
410	Rear Panel (P3 BT10)	5368251	Rear Panel Assy	1
411	Handle	5315120	Handle	1
412	3 port Conu board EMI cover	5314411	3 port Conu board EMI cover	1
413	LH Emi cover	5315111	EMI Cover Set	1
414	RH emi cover	5315111	EMI Cover Set	1

Section 9-7Pwa Assy



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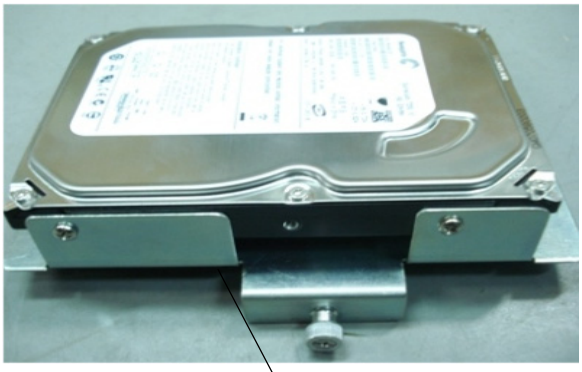

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Figure 9-7 PWA Assy

9-7-1 Pwa assy (cont'd)

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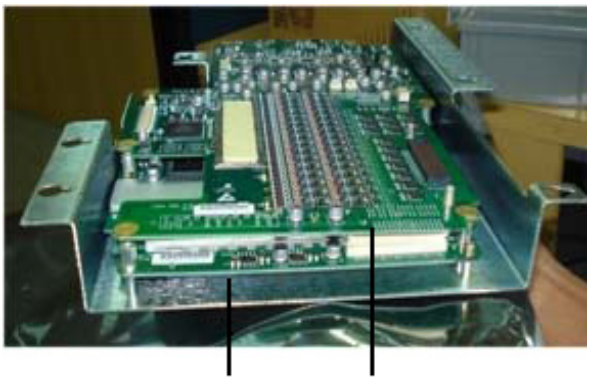

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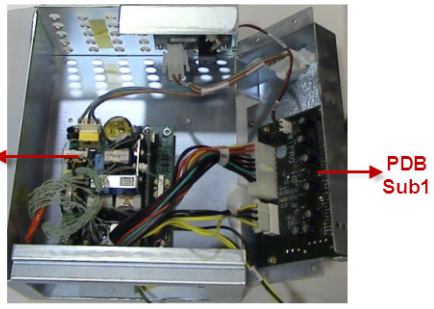

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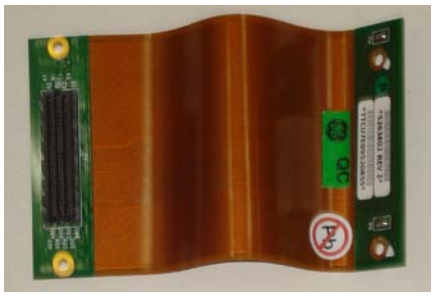
Figure 9-8 Pwa assy

Item	Part Name	Part Number	Description	Compatibility		
				P3 - R1.x.x	P3 BT10 R2.x.x	Qty
501	CWD	5124847	CWD	Yes	Yes	1
502	Connector Board 2PP Asm	5314412	Connector Board 2PP Asm	Yes	Yes	1
503	Sata Hard disk Assy	5315113	SATA HArd Disk Assy (160GB)	Yes	Yes	1
504	MST	5315025	MST	Yes	No	1
505	MST	5388844	MST	No	Yes	1
506	RX PWA	5315027	RX PWa ASM with Bracket	Yes	Yes	1
507	TX PWA	2404903	TX PWA	Yes	Yes	1
508	LV & PDB power supply	5315028	LV & Power Distribution Board assy	Yes	No	1
509	PDB Power supply	5370455	Power Distribution Board assy	No	Yes	1
	PDB Sub1	5370323	Collector part	No	Yes	1
	PDB Sub2	5397797	Collector part	No	Yes	1
510	Video Interface Board	5397507	Video Interface Board	No	Yes	1

Section 9-8
Flex PCB Cables



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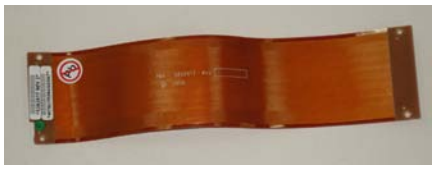

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Figure 9-9 Cable Assy

Item	Part NUm	Description	Quantity
601	5315108	Flex Cable (Con to Tx)	1
602	5315109	Flex Cable (MST to TX)	1

Section 9-9
Signal Cable Set

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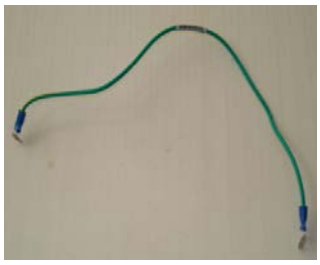

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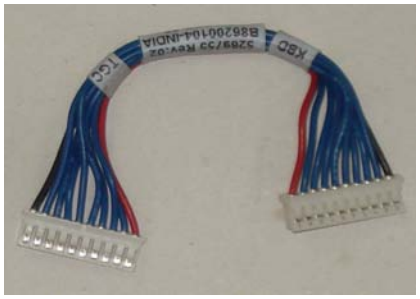

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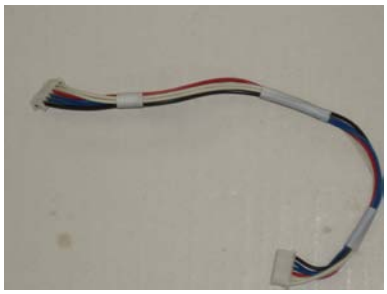

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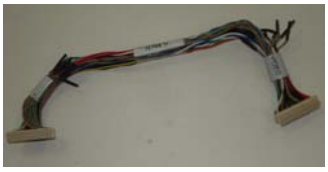

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Figure 9-10

Table 9-5 Signal Cable Set

Item	Part Name	Part Number	Description	Compatibility		
				P3 - R1.x.x	P3 BT10 R2.x.x	Qty
701	LCD signal Cable	5265925	LCD signal Cable	Yes	Yes	1
702	Docking Brd to Speaker	5262402	Docking Board to Speaker	Yes	Yes	1
703	SATA signal Cable	5273129	SATA signal Cable	Yes	Yes	1
704	Keyboard Ground Cable	5266424	Keyboard Ground Cable	Yes	Yes	1
705	TGC Interface Cable	5269755	TGC Interface Cable	Yes	Yes	1
706	Track ball 4 pin interface	5268980	Track ball 4 pin interface	Yes	Yes	1
707	Track ball 6 pin interface	5264458	Track ball 6 pin interface	Yes	Yes	1
708	Encoder PCB 15 pin interface	5267353	Encoder PCB 15 pin interface	Yes	Yes	1
709	VGA cable assembly	5342787	VGA cable assembly	No	Yes	1
710	Video Interface to MST board Cable assembly	5342788	Video Interface to MST board Cable assembly	No	Yes	1
711	Ethernet Cable assembly	5342786	Ethernet Cable assembly	No	Yes	1

Section 9-10
USB Cable set

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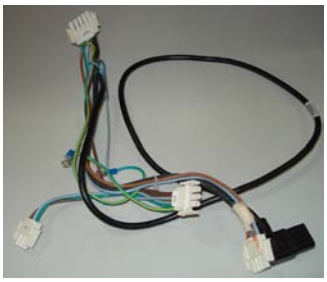
Figure 9-11

Table 9-6 USB Cable Set

Item	Part Name	Part Number	Description	Quantity
801	USB cable	5315039	USB Cable	1

Section 9-11
Power Cable Set



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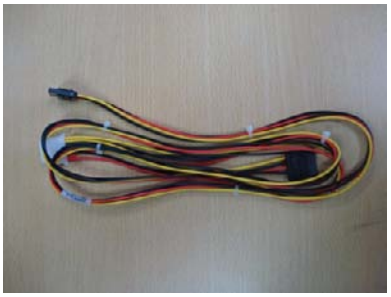

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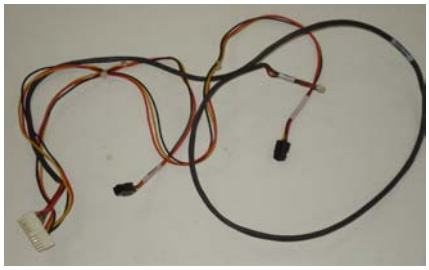

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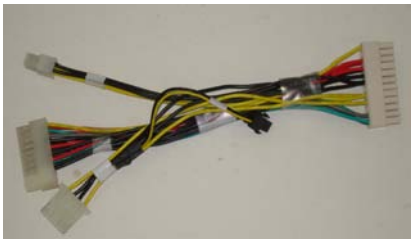

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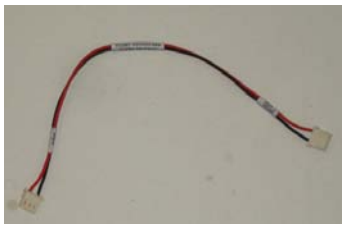

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Figure 9-12

Table 9-7 Power Cable Set

				Compatibility		
Item	Part Name	Part Number	Description	P3 - R1.x.x	P3 BT10 R2.x.x	Qty
901	Cable Assembly	5342775	Cable Assembly: 1 Power entry to PS, Relay and Printer	No	Yes	1
902	PDB to Conn Brd	5342888	PDB to Conn Board, MST Board and RP2 BRD_Cable Assembly	No	Yes	1
903	LCD DC Power cable	5366298	LCD DC Power cable	Yes	No	1
904	Dual SATA Power Cable	5269919	Dual SATA Power Cable	Yes	Yes	1
905	PDB to KBD and Fan	5270870	PDB to KBD and Fan	Yes	Yes	1
906	Conn Brd to TXB	5269067	Connector Board to TX Board	Yes	Yes	1
907	MST to KBD & DVD SATA Signal cable	5263844	MST to KBD & DVD SATA Signal cable	Yes	Yes	1
908	Power Supply output to PDB	5342783	Power Supply output to PDB	No	Yes	1
909	Power Supply Fan Cable Assembly	5390435	Power Supply Fan Cable Assembly	No	Yes	1
910	Cable assembly: 4 PDB to SBV board	5342782	Cable assembly: 4 PDB to SBV board	No	Yes	1
911	LCD DC Power cable	5269791	LCD DC Power cable	Yes	No	1
912	PDB to Conn Brd	5269059	PDB to Conn Board, MST Board	Yes	No	1

Section 9-12
Accessories and Kits

Table 9-8 Accessories and Kits (LOGIQ P3)

Item	Part Name	Part Number	Description	Quantity
1001	USB Footswitch	5151236	3 Pedal Footswitch	1
1002	Digital B/W Printer Thermal Printer	5160406	B/W Printer	1
1003	Color USB Thermal Printer- (Option)	5310886	Option part	1
1004	USB thumb Drive- (Option)	5308966	Option part	1
1005	LOGIQ P3 Application Software with Base ImageDVD	5308912-1	LOGIQ P3 Application Software with Base ImageDVD (R1.0.1)	1
1006	LOGIQ P3 Pro Application Software with Base ImageDVD	5315327-1	LOGIQ P3 Pro Application Software with Base ImageDVD (R1.0.1)	1
1007	LOGIQ P3 B/W Application Software with Base ImageDVD	5315328-1	LOGIQ P3 B/W Application Software with Base Image (R1.0.1)	1
1008	USB Hard Disk (160GB) - (Option)	5313598	USB Hard Disk (160GB) - (Option)	1
1009	DeskJet Printer- (Option)	5309104	Option part	1
1010	ECG Module	5262765	Option Part	1
1011	Power Cord India	2365882	Power Cord India	1
1012	Power Cord China	5248395	Power Cord China	1
1013	POWER CABLE Europe	5248396	POWER CABLE Europe	1
1014	POWER CABLE Japan	5248393	POWER CABLE Japan	1
1015	POWER CABLE America	5248394	POWER CABLE America	1

Table 9-6 Accessories and Kits (LOGIQ P3 BT10)

Item	Part Name	Part Number	Description	Quantity
1101	USB Footswitch	5151236	3 Pedal Footswitch	1
1102	Digital B/W Printer Thermal Printer	5160406	B/W Printer	1
1103	Color USB Thermal Printer- (Option)	5310886	Option part	1
1104	USB thumb Drive- (Option)	5308966	Option part	1
1105	LOGIQ P3 Application Software with Base ImageDVD	5368259	LOGIQ P3 Application Software with Base ImageDVD (R2.x.x)	1
1106	LOGIQ P3 Pro Application Software with Base ImageDVD	5397504	LOGIQ P3 Pro Application Software with Base ImageDVD (R2.x.x)	1
1107	LOGIQ P3 B/W Application Software with Base ImageDVD	5397506	LOGIQ P3 B/W Application Software with Base Image (R2.x.x)	1
1108	USB Hard Disk (160GB) - (Option)	5313598	USB Hard Disk (160GB) - (Option)	1

Item	Part Name	Part Number	Description	Quantity
1109	DeskJet Printer- (Option)	5309104	Option part	1
1110	ECG Module	5321614	Option Part	1
1111	Power Cord India	5337332	Power Cord India	1
1112	Power Cord China	5248395	Power Cord China	1
1113	POWER CABLE Europe	5248396	POWER CABLE Europe	1
1114	POWER CABLE Japan	5248393	POWER CABLE Japan	1
1115	POWER CABLE America	5248394	POWER CABLE America	1
1116	HP 470 Bluetooth Printer (BT 500 Bluetooth Dongle)	5400149	HP Bluetooth Printer	1
1117	Power Cord Brazil	5390874	Power Cord Brazil	1
1118	Power Cord Israel	5398510	Power Cord Israel	1
1119	Power Cord for UK/HK	5182816	Power Cord for UK/HK	1
1120	Power Cord Italy	5182940	Power Cord Italy	1
1121	Power Cord Denmark	5182083	Power Cord Denmark	1
1122	Power Cord Switzerland	5182235	Power Cord Switzerland	1

Section 9-13Probe

Table 9-9 Probes for LOGIQ P3

Item	Part Name	Part Number	Description	Quantity
1201	4C	5123455	Probe (Center Frequency: 3.2MHz)	1
1202	E8C	2294641	Probe (Center Frequency: 6.5MHz)	1
1203	8C	2348094	Probe (Center Frequency: 6.5MHz)	1
1204	5CS	5143934	Probe (Center Frequency: 5.6MHz)	1
1205	8L	5140738	Probe (Center Frequency: 6.2MHz)	1
1206	3S	2323337	Probe (Center Frequency: 2.0MHz)	1
1207	11L	5171885	Probe (Center Frequency: 7.5MHz)	1
1208	E8CS	47236865	Probe (Center Frequency: 6.5MHz)	1
1209	T739	2259246	Probe(Center Frequency: 6.4MHz)	1
Along with the above Probes, LOGIQ P3 BT10 include the following Probes:				
1210	3.8CA	5334810	Probe (Center Frequency: 3.75MHz±10%)	1
1211	6S	47236867	Probe (Center Frequency: 6.0MHz)	1
1212	7.5LA	5334811	Probe (Center Frequency: 7.5MHz±10%)	1

Section 9-14
Logiq P3 FRU List With Part Numbers

Table 10: FRU List

Part Number	Part Name
5314411	Connector Board 3PP Asm
5314412	Connector Board 2PP Asm
5315025 (LOGIQ P3)	MST Board Asm
5388844 (LOGIQ P3 BT10)	MST Board Asm
5308994	System on module (SOM)
5315026	CWD Assy
5315027	Rx PWA Asm with bracket
2404903	Transmit Board
5315028 (LOGIQ P3)	LV and Power distribution Board Assy
5370323 (LOGIQ P3 BT10)	Power distribution Board Assembly
5370455	Power Supply Assembly BT10
5397797	Power Supply with screw
5397502	Power Entry Module with Stickers
5389807	Power Cord Clamp P3-BT10
5313708 (LOGIQ P3)	Rear Panel ASSY -100V / 220V
5368251 (LOGIQ P3BT10)	Rear Panel ASSY
5314404	Keyboard Asm complete
5315106	A/N KB complete
5315029	TB Asm complete
5315107	TGC Asm
5315111	EMI cover set
5315113	HDD Asm
5315114	Side Left cover
5315115	Side Right cover
5315116	Front Cover
5315117	Rear cover
5315118 (LOGIQ P3)	Front Castor Wheel Assy
5315119 (LOGIQ P3 BT10)	Back Castor Wheels Assy
5368246 (LOGIQ P3)	Front Castor Wheel Assy

Table 10: FRU List

5368247 (LOGIQ P3 BT10)	Back Castor Wheels Assy
5315120	Handle Assy
5310093	LCD Arm cover
5396925	P3 LCD Monitor DC
5219747	Cable Guard Clamp
5196448 (LOGIQ P3)	Transformer Assembly
5268853 (LOGIQ P3BT10)	Transformer Assembly
5315121	Top Cover Assy
5312274	5312274 SATA DVD RW Drive
5315122	KBD rear Cover Assy
5315502	Knob Set
5388845 (LOGIQ P3 BT10)	Power Cable set
5388847 (LOGIQ P3 BT10)	Signal Cable set
5315124	Key Caps
5308912-1 (LOGIQ P3)	LOGIQ P3 Application Software with Base Image
5368259 (LOGIQ P3 BT10)	LOGIQ P3 Application Software with Base Image
5337332 (LOGIQ P3)	Power Cord India
2365882 (LOGIQ P3 BT10)	Power Cord India
5248395 (LOGIQ P3 BT10)	Power Cord China
5182816 (LOGIQ P3 BT10)	Power Cord UK/HK
5182940 (LOGIQ P3 BT10)	Power Cord Italy
5182083 (LOGIQ P3 BT10)	Power Cord Denmark
5182235 (LOGIQ P3 BT10)	Power Cord Switzerland
5398510 (LOGIQ P3 BT10)	Power Cord Israel
5390874 (LOGIQ P3 BT10)	Power Cord Brazil
5248396	POWER CABLE Europe
5248393	POWER CABLE Japan
5248394	POWER CABLE America
5151236	Foot-switch- (Option)
5262765 (LOGIQ P3)	ECG Module- (Option)
5321614 (LOGIQ P3 BT10)	ECG Module- (Option)
5160406	B/W USB Thermal Printer
5309104	DeskJet Printer- (Option)
5310886	Color USB Thermal Printer- (Option)

Table 10: FRU List

5400149	HP Bluetooth Printer (BT 500 - Bluetooth Dongle)
5312274	SATA DVD Writer
5313598	USB Hard Disk- - (Option)
5313573	Probe Holder
5308996	1GB_USB_Thumb_Drive
5262796	Encoder set for Logiq A3 KBD
5315328-1 (LOGIQ P3)	LOGIQ P3 Application Software For BW
5397506 (LOGIQ P3 BT10)	LOGIQ P3 Application Software For BW
5315327-1 (LOGIQ P3)	LOGIQ P3 Application Software For PRO
5397504 (LOGIQ P3)	LOGIQ P3 Application Software For PRO
5334810	3.8CA Convex Array Probe
5334811	7.5LA Linear Array Probe
5314414 (LOGIQ P3 BT10)	Fan Assy
5397507 (LOGIQ P3 BT10)	Video Interface Board

Chapter 10
Care & Maintenance

Section 10-1
Overview

10-1-1 Periodic Maintenance Inspections

It has been determined by engineering that your LOGIQ P3 system does not have any high wear components that fail with use, therefore no Periodic Maintenance Inspections are mandatory. Some Customers Quality Assurance Programs may require additional tasks and or inspections at a different frequency than listed in this manual.

10-1-2 Purpose of Chapter 10

This chapter describes **Care & Maintenance** on the scanner and peripherals. These procedures are intended to **maintain the quality** of the ultrasound **systems performance**. Read this chapter completely and familiarize yourself with the procedures before performing a task.

Table 10-1 Contents in Chapter 10

Section	Description	Page Number
10-1	Overview	10-1
10-2	Why do Maintenance	10-2
10-3	Maintenance Task Schedule	10-2
10-4	Tools Required	10-4
10-5	System Maintenance	10-7
10-6	Using a Phantom	10-12
10-7	Electrical Safety Tests	10-12
10-8	When There's Too Much Leakage Current...	10-29

CAUTION **Practice good ESD prevention. Wear an anti–static strap when handling electronic parts and even when disconnecting/connecting cables.**

DANGER **BE SURE TO DISCONNECT THE SYSTEM POWER PLUG BEFORE YOU REMOVE ANY PARTS. BE CAUTIOUS WHENEVER POWER IS STILL ON AND COVERS ARE REMOVED.**

CAUTION **Do not pull out or insert circuit boards while power is ON.**

CAUTION **Do not operate this unit unless all board covers and frame panels are securely in place. System performance and cooling require this.**

Section 10-2
Why do Maintenance

10-2-1 Keeping Records

It is good business practice that ultrasound facilities maintain records of periodic and corrective maintenance. The Ultrasound Periodic Maintenance Inspection Certificate provides the customer with documentation that the ultrasound scanner is maintained on a periodic basis.

A copy of the Ultrasound Periodic Maintenance Inspection Certificate should be kept in the same room or near the scanner.

10-2-2 Quality Assurance

In order to gain accreditation from organizations such as the American College of Radiology (USA), it is the customer's responsibility to have a quality assurance program in place for each scanner. The program must be directed by a medical physicists, the supervising radiologist/physician or appropriate designee.

Routine quality control testing must occur regularly. The same tests are performed during each period so that changes can be monitored over time and effective corrective action can be taken.

Testing results, corrective action and the effects of corrective action must be documented and maintained on the site.

Your GE service representative can help you with establishing, performing and maintaining records for a quality assurance program. Please contact us for coverage information and/or price for service.

Section 10-3
Maintenance Task Schedule

10-3-1 How often should care & maintenance tasks be performed?

The Care & Maintenance Task Schedule (provided on page 10-3) specifies how often your LOGIQ P3 should be serviced and outlines items requiring special attention.

NOTE: It is the customer's responsibility to ensure the LOGIQ P3 care & maintenance is performed as scheduled in order to retain its high level of safety, dependability and performance.

Your GE Service Representative has an in-depth knowlegde of your LOGIQ P3 ultrasound scanning system and can best provide competent, efficient service. Please contact us for coverage information and/or price for service.

The service procedures and recommended intervals shown in the Care & Maintenance Task Schedule assumes that you use your LOGIQ P3 for an average patient load (10-12 per day) and use it as a primary mobile unit which is transported between diagnostic facilities.

NOTE: If conditions exist which exceed typical usage and patient load, then it is recommended to increase the maintenance frequencies.

Table 10-2 Customer Care Schedule

Service at Indicated Time	Daily	Weekly	Monthly	Per Facilities QA Program	Notes
Clean Probes	•*				* or before each use
Clean Probe Holders	•				
Inspect AC Mains Cable			•		Mobile Unit Check Weekly
Inspect Cables and Connectors			•		
Clean Console			•		
Clean Air filter		•			More frequently depending on your environment
Clean LCD			•		
Inspect Wheels,Casters,brakes, and Swivel locks			•		Mobile unit check Daily
Console Leakage Current Checks				**See Note**	**Twice Annually**
Peripheral Leakage Current Checks				**See Note**	**Twice Annually**
Surface Probe Leakage Current Checks				**See Note**	**Twice Annually**
Endocavity Probe Leakage Current Checks				**See Note**	**Quarterly Annually**
Measurement Accuracy Checks				**See Note**	**Twice Annually**

NOTE: May require specialized equipment to complete

NOTE: PMs are not mandatory, the table above is for reference only.

Section 10-4
Tools Required

10-4-1 Standard GE Tool Kit

The following is a description of the “Standard” GE tool kit in the USA. Not all tools are required for PMs.

Table 10-3 Overview of GE-1 Tool Kit Contents

Tool ID	Description	Tool ID	Description
9-45358	Pliers Retaining Ring	9-XL9971MM	Xcelite-hex Blade 1.27mm
9-4078	Scribe	9-XL9972MM	Xcelite-hex Blade 1.5mm
9-44572	Wrench Open End 3/8 - 7/16	9-XL9973MM	Xcelite-hex Blade 2 mm
9-44579	Wrench Open End 1/2 - 9/16	9-XL9974MM	Xcelite-hex Blade 2.5mm
9-44579	Wrench Open End 1/2 - 9/16	9-XL9975MM	Xcelite-hex Blade 3mm
9-45385	Pliers, Arc Joint 7 inch	9-XL9976MM	Xcelite-hex Blade 4mm
9-45378	Pliers, Slip Joint	9-XL9977MM	Xcelite-hex Blade 5mm
9-4518	Pliers, Long Nose, Miniature	9-XL991CM	Handle
9-4518	Pliers, Long Nose, Miniature	C2356E	Screw starter - Kedman Quick Wedge
9-44776	Ignition Wrench Set, 10 pc.	BLBO	Box - 18 Compartment
9-44601	Wrench, Adj., 4 inch	DWL4283T	Box - 5 Compartment
9-4151	Screwdriver, Blade, Stubby	9-41322	Pickup Tool, Claw type
9-41421	Screwdriver, Blade, Pocket clip	9-6757	6 pc Needle File Set
9-41594	Screwdriver, Blade 1/8 in. x 4 in.	9-9487	Utility Knife
9-41581	Screwdriver, Blade 3/16 in. x 4 in.	9-45341	Pliers Vice Grip 10 inch
9-39451	20' Steel Tape, locking Spring load	9-3001	Xacto Pen Knife
9-GH807	Ratchet, Offset, Slotted	9-HT62002	Solder Aid, Fork and Hook
68-412	Ratchet, Offset, Phillips	9-4099	Mirror, Round, Telescoping
9-GH130	Tapered Reamer	9-GH3001	Steel Rule Decimal 6 inch
9-41584	Screwdriver, slotted 1/4 in.X 6 in.	9-GH300ME	Steel Rule Metric 6 inch
9-4118	Screwdriver, Phillips #2, Stubby	9-XL9920	Xcelite-hex Blade.050 inch
9-41293	Screwdriver, Phillips #0	9-XL9921	Xcelite-hex Blade 1/16 inch
9-41294	Screwdriver, Phillips #1	9-XL9922	Xcelite-hex Blade 5/16 inch
9-41295	Screwdriver, Phillips #2	9-XL9923	Xcelite-hex Blade 3/32 inch
9-46677	Hex Keys, 20 pc., Metric	9-XL9924	Xcelite-hex Blade 1/8 inch
9-34701	1/4 in. Standard.Socket set (19 pc)	9-XL9925	Xcelite-hex Blade 5/32 inch
9-43499	1/2 inch Socket 1/4 inch drive	9-XL9926	Xcelite-hex Blade 3/16 inch
9-4355	Flex Spinner	9-XL99764	Xcelite-hex Blade 7/64
9-43523	Breaker	9-XL99964	Xcelite-hex Blade 9/64
9-43531	6 inch Ext.	9-XLM60	Mini-screwdriver kit

Table 10-3 Overview of GE-1 Tool Kit Contents (Continued)

Tool ID	Description	Tool ID	Description
9-65283	Case 8.5 in. x 4.5 in. x 2 in. Deep	9-45072	Pliers 6 inch Diagonal
9-46696	Hex Keys	9-XL100X	Wire Stripper/Cutter 5 inch - 100X
9-39829	Torpedo Level, Magnetic	9-XL87CG	Pliers - very fine needle nose-87CG
9-38461	Hammer, Ball Peen, 4 oz	9-WEWDT-07	Weller-Soldering-Replacement Tip(1)
9-4280	Universal Joint 1/4 inch	9-WS175-E	Wiss - Surgical Scissors
9-WEW60P3	Weller - Soldering Iron, 3 wire	KH174	Hemostat 5 inch Straight
9-WECT5B6	Weller - Soldering Iron Tip	KH175	Hemostat 5 inch curved
9-WEWDP12	Weller - Desoldering Pump	9-Z9480121	Alignment tool (red)
93383	Flashlight Mini-Mag Lite (AAA Bat.)		
9-GH408	Tweezers		
21576	Brush - Bristle		
9-4516	Pliers 4 1/4 inch Diagonal		

Table 10-4 Overview of GE-2 Tool Kit Contents

GE-2 Sears Kit (#99034)			
Tool ID	**Description**	**Tool ID**	**Description**
9-45381	Pliers, Arc Joint 9 1/2 inch	9-44067	Socket 1 1/16 in. for 1/2 in. drive
9-45092	Pliers, Linesman 8 1/2 inch	9-42679	Socket 10MM Hex for 1/2 in. drive (2273333)
9-42882	Punch, Pin 3/32 inch	9-44262	Extension 10 inch for 1/2 in. drive (2273405)
9-42884	Punch, Pin 5/32 inch	9-4258	3/8 inch to 1/2 inch Adapter
9-42886	Punch, Pin 1/4 inch	9-34374	3/8 inch Metric Socket Set - 12 PT
9-42973	Cold Chisel 1/2 inch	9-44311	16mm Socket 12 pt.
9-GH77	Center Punch Automatic	9-33485	Metal Socket Tray
9-GH890	File Handle, Adj.	9-33484	Metal Socket Tray
9-31276	File, Round, Bastard 8 inch	9-33484	Metal Socket Tray
9-31277	File, Half Round, Bastard 8 inch	9-52068	Tap and Drill Set
9-31263	File, Flat Mill 8 inch	9-52722	#6 Tap
21045C	Close Quarter Saw	9-52723	#8 Tap
9-44604	Wrench, Adj 10 inch		High Speed Drill Set
9-41587	Screwdriver 5/16 inch x 8 inch		#36 Drill
9-41586	Screwdriver, Stubby 5/16 inch		#29 Drill
9-GH19512	Countersink 1/2 inch	9-44046	3/8 inch Socket Set
9-44741	12 PC Combination Wrench Set		

10-4-2 Special Tools, Supplies and Equipment

10-4-2-1 Specific Requirements for Care & Maintenance

Table 10-5 Overview of Requirements for Care & Maintenance

Tool	Part Number	Comments
Digital Volt Meter (DVM)		
Electric Safety Analyzer DALE 600	46-285652G1	For 120V Unit
Electric Safety Analyzer DALE 600E	46-328406G2	For 220V Units
Leakage Current Ultrasound Kit	2113015	For 120V and 220V Units
Anti Static Kit	46–194427P231 46–194427P279 46–194427P369 46–194427P373 46–194427P370	Kit includes anti–static mat, wrist strap and cables for 200 to 240 V system 3M #2204 Large adjustable wrist strap 3M #2214 Small adjustable wrist strap 3M #3051 conductive ground cord
Anti Static Vacuum Cleaner	46–194427P278 46–194427P279	120V 230V
Safety Analyzer	46–285652G1	DALE 600 KIT (or equivalent) for electrical tests
QIQ Phantom	E8370RB	RMI Grayscale Target Model 403GS
B/W Printer Cleaning Sheet		See printer user manual for requirements
Color Printer Cleaning Sheet		See printer user manual for requirements
Disposable Gloves		
Emergency Repair Disk	5173797	Emergency Repair Disk should be an external USB disk which compliance with local regulatory requirements. The HDD capacity should be over 30GB and should only have one hard disk partition. Refer to section 4-3-14-5 for how to use the emergency repair disk on LOGIQ P3.

Section 10-5
System Maintenance

10-5-1 Preliminary Checks

The preliminary checks take about 15 minutes to perform. Refer to the system user documentation whenever necessary.

NOTE: Recommended to have one Preventive Maintenance per year.

Table 10-6 System Checks

Step	Item	Description
1	Ask & Listen	Ask the customer if they have any problems or questions about the equipment.
2	Paperwork	Fill in the top of the Ultrasound Inspection Certificate (see page 10- 30). Note all probes and system options.
3	Power up	With AC input. Turn the system power on and verify that all fans and peripherals turn on. Watch the displays during power up to verify that no warning or error messages are displayed.
4	Probes	Verify that the system properly recognizes all probes.
5	Displays	Verify proper display on the LCD.
6	Presets	Backup all customer presets on an DVD-RW.

10-5-2 Functional Checks (See Also Chapter 4)

The functional checks take about 60 minutes to perform. Refer to the system user documentation whenever necessary.

10-5-2-1 System Checks

Table 10-7 System Functional Checks

÷	Step	Description
	B-Mode	Verify basic B-Mode (2D) operation. Check the basic system controls that affect this mode of operation.
	CF-Mode	Verify basic CF-Mode (Color Flow Mode) operation. Check the basic system controls that affect this mode of operation.
	Doppler Modes	Verify basic Doppler operation (PW if available). Check the basic system controls that affect this mode of operation.
	M-Mode	Verify basic M-Mode operation. Check the basic system controls that affect this mode of operation.
	*Applicable Software Options	Verify the basic operation of all optional modes such as Multi-Image, 3D, Harmonics, Cine,... etc. Check the basic system controls that affect each options operation.
	TXmit/Recv Elements	Use the Visual Channel Utility on the loop connect to verify that all system Txmit/recv channels are functional.
	System Diagnostics	Perform the Automatic Test, to verify that all boards function according to specification.
	Keyboard Test	Perform the Keyboard Test Procedure to verify that all keyboard controls are OK.
	LCD	Verify basic LCD display functions. Refer to Chapter 3 of the User Manual.
	Software Menu check	Verify Software Menu display functions. Refer to Chapter 3 of the User Manual.
	Measurements	Scan a gray scale phantom and use the measurement controls to verify distance and area calculation accuracy. Refer to the User Manual, Chapter 18, for measurement accuracy specifications.

*NOTE: * Some software may be considered standard depending upon system model configuration.*

10-5-2-2 Peripheral/Option Checks

If any peripherals or options are not part of the system configuration, the check can be omitted. Refer to the User Manual for a list of approved peripherals/options.

Table 10-8 GE Approved Peripheral/Hardware Option Functional Checks

Step	Item	Description
1	B/W Printer	Verify hardcopy output of the B/W video page printer. Clean heads and covers if necessary.
2	Color Printer	Verify hardcopy output of the Color video page printer. Clean heads and covers if necessary.
3	DICOM	Verify that DICOM is functioning properly. Send an image to a DICOM device.
4	Footswitch	Verify that the footswitch is functioning as programed. Clean as necessary.
5	ECG	Verify basic operation with customer.
6	DVD	Verify that the DVD is functioning properly. Clean heads and covers if necessary.

10-5-3 Input Power

10-5-3-1 AC Power Inspection

Table 10-9 AC Inspection

Step	Item	Description
1	Unplug Cord	Disconnect the mains cable from the wall and system.
2	Inspect	Inspect it and its connectors for damage of any kinds.
3	Verify	Verify that the LINE wires are properly attached to the terminals, and that no strands may cause a short circuit.

10-5-4 Cleaning

10-5-4-1 General Cleaning

Table 10-10 General Cleaning

Step	Item	Description
1	Console	Use a fluid detergent in warm water on a soft, damp cloth to carefully wipe the entire system. Be careful not to get the cloth too wet so that moisture does not enter the console.
2	Probe Holder	Clean probe holders. (they may need to be soaked to remove excess gel).
3	LCD	Use a soft, non-abrasive folder cloth. Gently wipe the LCD face. DO NOT use a glass cleaner that has a hydrocarbon base (such as Benzene, Methy Alcohol or Methy Ethyl Ketone) on LCD with the filter (anti-glare shield).

10-5-5 Physical Inspection

Table 10-11 Physical Checks

Step	Item	Description
1	Labeling	Verify that all system labeling is present and in readable condition. Refer to User Manual, ... for details.
2	Scratches & Dents	Inspect the console for dents, scratches or cracks.
3	Control Panel	Inspect keyboard and control panel. Note any damaged or missing items.
4	Cables & Connectors	Check all internal cable harnesses and connectors for wear and secure connector seating. Pay special attention to footswitch assembly and probe strain or bend reliefs.
5	Shielding & Covers	Check to ensure that all EMI shielding, internal covers, air flow panels and screws are in place. Missing covers and hardware could cause EMI/RFI problems while scanning.
6	External I/O	Check all connectors for damage.
7	Op Panel Lights	Check for proper operation of all operator panel and Freeze Key light.

10-5-6 Optional Diagnostic Checks

Optionally you can access the diagnostic software as described in Chapter 5 or 7. View the error logs and run desired diagnostics.

10-5-6-1 View the Logs

1.) Review the system error log for any problems.
2.) Check the temperature log to see if there are any trends that could cause problems in the future.
3.) Check the Configuration Log; update if needed.

10-5-7 Probe Maintenance

10-5-7-1 Probe Related Checks

Table 10-12 Probe Related Checks

Step	Item	Description
1	Probe Holder	Clean probe holders (they may need to be soaked to remove excess gel).
2	Probes	Thoroughly check the system probe connectors and remove dust from inside the connector sockets if necessary. Visually check for bent, damaged or missing pins

10-5-7-2 Basic Probe Care

The system user manuals and various probe handling cards provide a complete description of probe care, maintenance, cleaning and disinfection. Ensure that you are completely familiar with the proper care of GE probes.

Ultrasound probes can be easily damaged by improper handling. See the User Manual and probe care cards for more details. Failure to follow these precautions can result in serious injury and equipment damage. Failure to properly handle or maintain a probe may also void its warranty.

Any evidence of wear indicates the probe cannot be used.

Do a visual check of the probe pins and system sockets before plugging in a probe.

10-5-7-3 Basic Probe Cleaning

Refer to the User's Manual for details on probe cleaning.

NOTE: To help protect yourself from blood borne diseases, wear approved disposable gloves. These are made of nitrile derived from vegetable starch to prevent allergic latex reactions.

NOTE: Failure to follow the prescribed cleaning or disinfection procedures will void the probe's warranty. DO NOT soak or wipe the lens with any product not listed in the User Manual. Doing so could result in irreparable damage to the probe. Follow care instructions that came with the probe.

NOTE: Disinfect a defective probe before you return it. Be sure to tag the probe as being disinfected.

Section 10-6
Using a Phantom

See the Basic User Manual "*Customer Maintenance*" for information on using a phantom and quality assurance tests.

Section 10-7
Electrical Safety Tests

10-7-1 Safety Test Overview

The electrical safety tests in this section are based on and conform to IEC 60601-1 Medical Equipment Safety Standards. They are intended for the electrical safety evaluation of cord-connected, electrically operated, patient care equipment. If additional information is needed, refer to the IEC 60601-1 documents.

WARNING ***THE USER MUST ENSURE THAT THE SAFETY INSPECTIONS ARE PERFORMED AT LEAST EVERY 6 MONTHS ACCORDING TO THE REQUIREMENTS OF THE PATIENT SAFETY STANDARD IEC-EN 60601-1. ONLY TRAINED PERSONS ARE ALLOWED TO PERFORM THE SAFETY INSPECTIONS MENTIONED ABOVE.***

CAUTION **To avoid electrical shock, the unit under test must not be connected to other electrical equipment. The unit under test must not be contacted by users or patients while performing these tests.**

CAUTION **Possible risk of infection. Do not handle soiled or contaminated probes and other components that have been in patient contact. Follow appropriate cleaning and disinfecting procedures before handling the equipment.**

Test the system, peripherals and probes for leakage current. Excessive leakage current can cause injury or death in sensitive patients. High leakage current can also indicate degradation of insulation and a potential for electrical failure. Do not use probes or equipment having excessive leakage current.

To minimize the risk that a probe may shock someone the customer should:

- Not use a probe that is cracked or damaged in any way
- Check probe leakage current:
    * once a year on surface probes
    * twice a year on endocavitary probes
    * whenever probe damage is suspected

10-7-2 GEMS Leakage Current Limits

The following limits are summarized for NFPA 99 (For USA), IEC 60601-1 Medical Equipment Safety Standards, and IEC 62353 Medical Electrical Equipment — Recurrent test and test after repair of medical electrical equipment. Measurement limits per IEC 60601-1 Medical Equipment Safety Standards, Table IV.

Table 10-13 Chassis Leakage Current Limits—Accessible Metal Surfaces

Normal Condition	Open Ground	Open Neutral
0.1 mA	0.5 mA	0.5 mA

Table 10-14 Type BF Applied Part Leakage Current Limits - Non-Conductive (Floating) Surface and Cavity Probes

All Countries	Normal Condition	Open Ground	Open Neutral
AC	0.1 mA	0.5 mA	0.5 mA
DC**	0.01 mA	0.05 mA	0.05 mA

Table 10-15 Type CF Applied Part Leakage Current Limits - Surgical Probes and ECG Connections

Normal Condition	Open Ground	Open Neutral
0.01 mA	0.05 mA	0.05 mA

**

*NOTE: *Measurement limits per IEC 60601-1 Medical Equipment Safety Standards, Table IV*

***Most meters (like Dale 600/601) measure a composite of the AC and DC leakage current.*

10-7-3 Outlet Test - Wiring Arrangement

Test all outlets in the area for proper grounding and wiring arrangement by plugging in the neon outlet tester and noting the combination of lights that are illuminated. Any problems found should be reported to the hospital immediately and the receptacle should not be used.

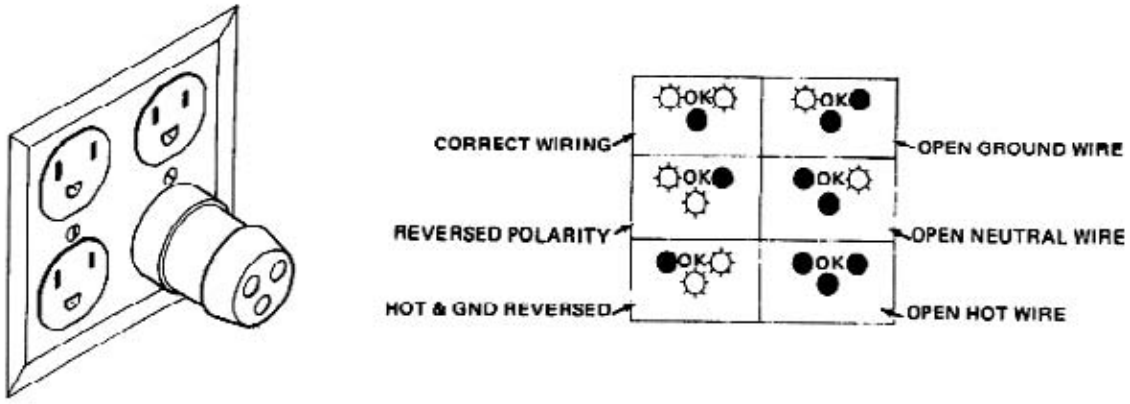

Figure 10-1 Typical Alternate Outlet Tester

The Dale 600 has self-contained lamps designed for testing the outlet wiring arrangement. Plug the Dale 600 into each outlet to be tested comparing the lamp status.

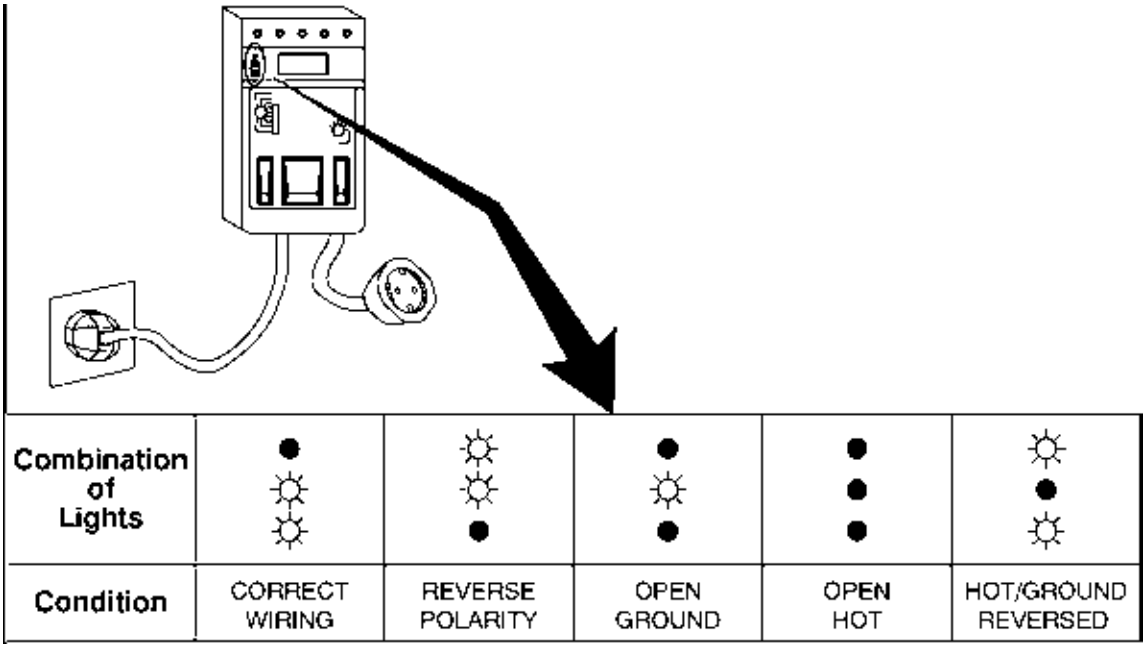

Figure 10-2 Dale 600 Outlet Test

NOTE: No outlet tester can detect the condition where the Neutral (grounded supply) conductor and the Grounding (protective earth) conductor are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

10-7-4 Grounding Continuity

CAUTION **Electric Shock Hazard. The patient must not be contacted to the equipment during this test**

Measure the resistance from the third pin of the attachment plug to the exposed metal parts of the case. The ground wire resistance should be less than **0.2** ohms. Reference the procedure in the IEC 601-1.1.

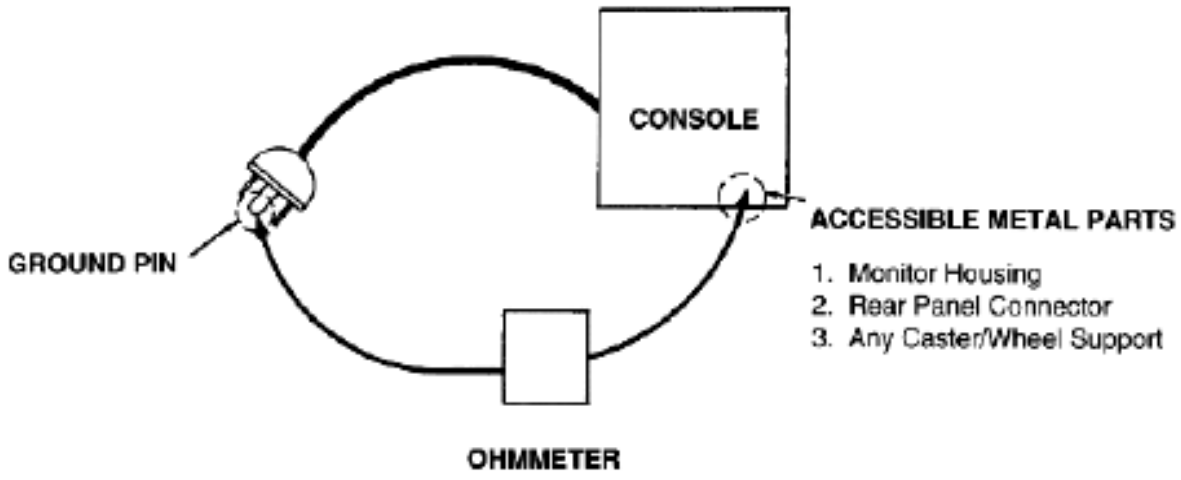

Figure 10-3 Ground Continuity Test

10-7-4-1 Meter Procedure

Follow these steps to test the ground wire resistance.

1.) Turn the LOGIQ P3 unit OFF.

2.) Plug the unit into the meter, and the meter into the tested AC wall outlet.

3.) Plug the black chassis cable into the meter's “CHASSIS” connector and attach the black chassis cable clamp to an exposed metal part of the LOGIQ P3 unit.Set the meter's “FUNCTION” switch to the RESISTANCE position.

4.) Set the meter's “POLARITY” switch to the OFF (center) position.

5.) Measure and record the ground wire resistance.

10-7-4-2 Dale 600 - Ground Continuity

The Dale 600 measures line cord resistance from the third pin of the attachment plug to the meter's Chassis Cable clamp. Test the grounding continuity of the system to all exposed metal parts in accordance with the IEC 601-1.1 procedure as above. Refer to the Dale 600 Instruction Manual for meter self tests and operation. Record measured resistance of the grounding continuity. The ground wire resistance should be less than 0.2 (Use any safety analyzer.)

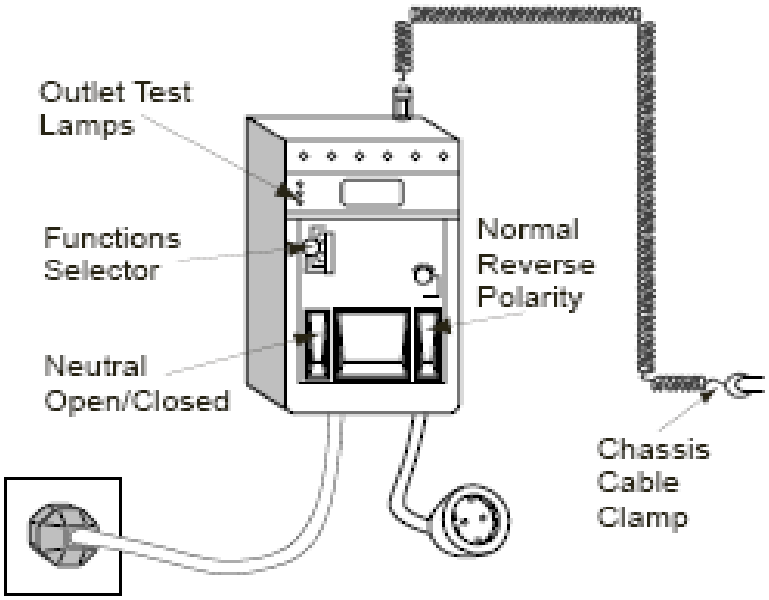

Figure 10-4 Dale 600 Ground Continuity Test

10-7-5 Chassis Leakage Current Test

10-7-5-1 Definition

This test measures the current that would flow in a grounded person who touched accessible metal parts of the bedside station if the ground wire should break. The test verifies the isolation of the power line from the chassis. The meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit On and Off, with the power line polarity Normal and Reversed. Record the highest reading.

CAUTION **Electric Shock Hazard. When the meter's ground switch is OPEN, don't touch the unit!**

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

10-7-5-2 Generic Procedure

The test verifies the isolation of the power line from the chassis. The testing meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit ON and OFF, with the power line polarity Normal and Reversed. Record the highest reading of current.

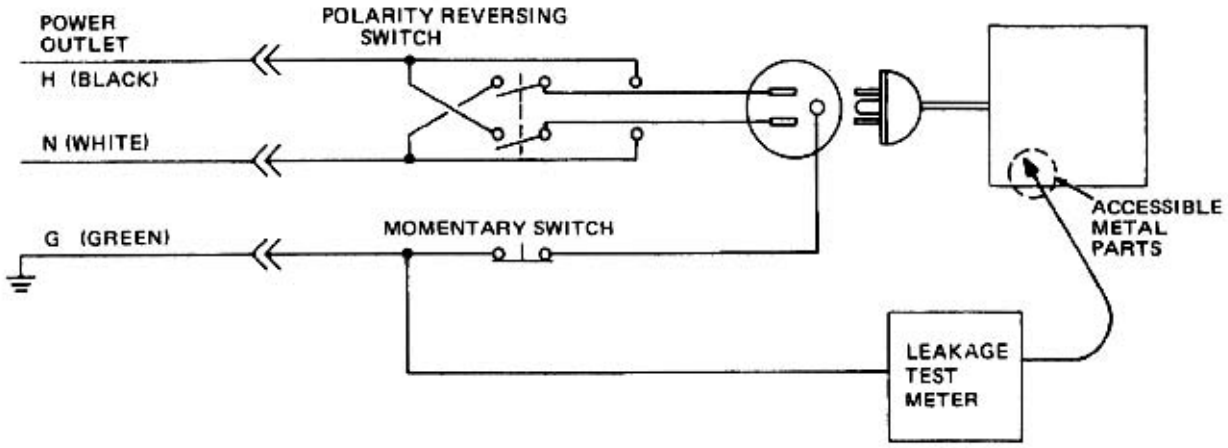

Figure 10-5 Set Up for Chassis Source Leakage Current, IEC 601-1 Clause 19 - Continuos Leakage Currents and Patient, Auxiliary Currents

When using the Microguard or a similar test instrument, its power plug may be inserted into the wall outlet and the equipment under test is plugged into the receptacle on the panel of the meter. This places the meter in the grounding conductor and the current flowing from the case to ground will be indicated in any of the current ranges. The maximum allowable limit for chassis source leakage is shown in Table 10-13.

10-7-5-3 Dale 600 Meter Procedure

When measuring system chassis currents with the Dale 600, always use the CHASSIS selection of the external/chassis function switch. This requires the ground clip lead and changing the meters switches in accordance with the IEC 601-1.1. Refer to the Dale 600 Instruction Manual for meter self-test and operation. Record the highest leakage current measured.

Follow these steps to test the unit for leakage current.

1.)Turn the LOGIQ P3 unit OFF.

2.)Plug the unit into the meter, and the meter into the tested AC wall outlet

3.)Plug the black chassis cable into the meter's “CHASSIS” connector and attach the black chassis cable clamp to an exposed metal part of the LOGIQ P3.

4.)Set the tester's “FUNCTION” switch to CHASSIS position.

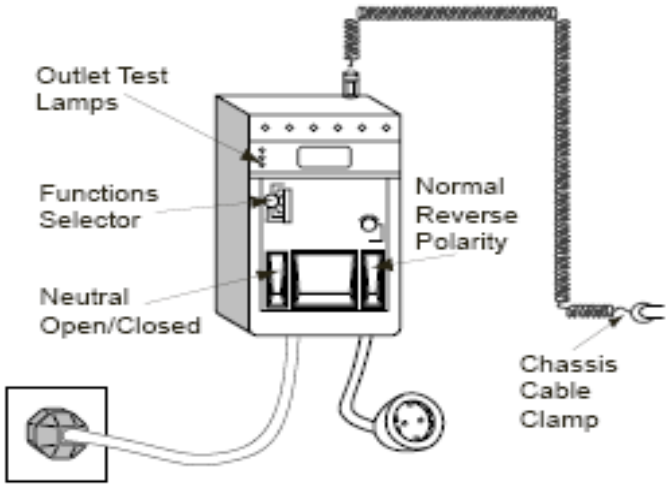

Figure 10-6 Ground and Chassis Leakage Current Test

5.)Follow the test conditions described for respective test points shown in Table 10-16.

TEST	CONDITION
1	Mounting screw for probe receptacle
2	Wheel support
3	Mounting screw for peripheral plugged into unit
4	Mounting screw for other peripheral powered by unit

Table 10-16 Chassis Leakage Current Test Condition

6.) Keep a record of the results with other hard copies of PM data kept on site.

10-7-5-4 Data Sheet for enclosure Source Leakage Current

The test passes when all readings measure less than the value shown in Table 10-13. Record all data on the PM Inspection Certificate.

Table 10-17 Typical Data Sheet for enclosure Source Leakage Current

Unit Power	Tester Polarity Switch	Tester Neutral or Ground Switch	Test 1 Speaker Cover	Test 2 Real Panel Metal Parts	Optional Test 3	Optional Test 4
Enter Name of tested peripheral here:						
ON	NORM	OPEN				
ON	NORM	CLOSED				
ON	REV	OPEN				
ON	REV	CLOSED				
OFF	NORM	OPEN				
OFF	NORM	CLOSED				
OFF	REV	OPEN				
OFF	REV	CLOSED				

10-7-6 Isolated Patient Lead (Source) Leakage–Lead to Ground

10-7-6-1 Definition

This test measures the current which would flow to ground from any of the isolated ECG leads. The meter simulates a patient who is connected to the monitoring equipment and is grounded by touching some other grounded surface. Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the ultrasound console Off and On. For each combination the operating controls, such as the lead switch, should be operated to find the worst case condition.Generic Procedure

CAUTION **Equipment damage possibility. Never switch the Polarity when the unit is powered ON. Be sure to turn the unit power OFF before switching the polarity using the POLARITY switch. Otherwise, the unit may be damaged.**

10-7-6-2 Generic Procedure

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the unit Off and On. For each combination, the operating controls such as the lead switch should be operated to find the worst case condition.

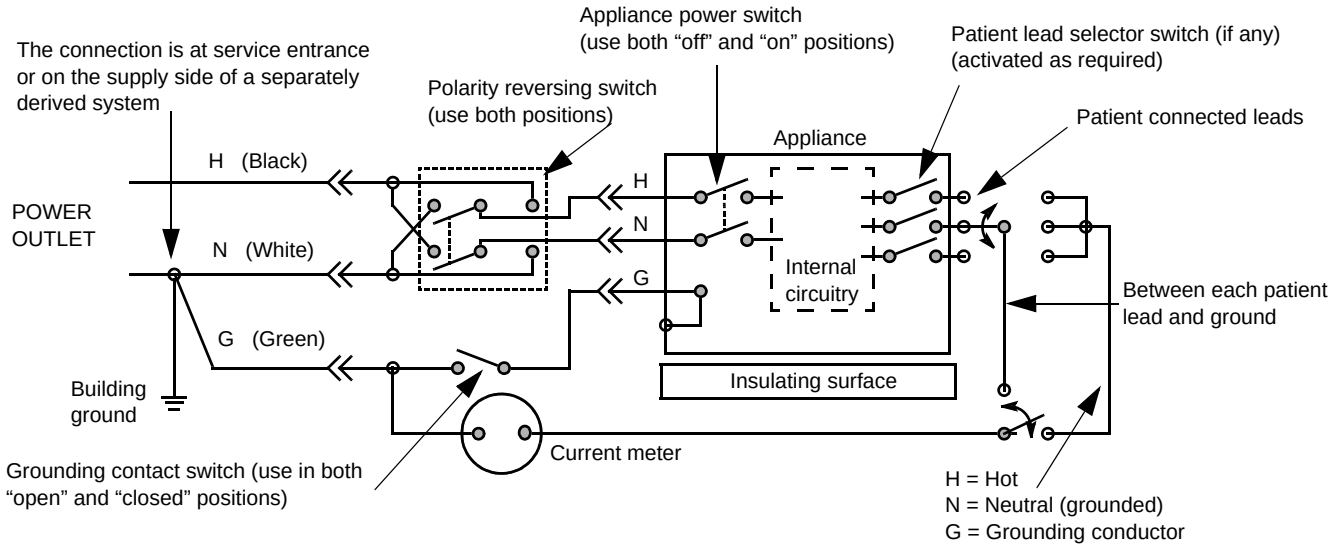
The connection is at service entrance or on the supply side of a separately derived system
Appliance power switch (use both "off" and "on" positions)
Patient lead selector switch (if any) (activated as required)
Polarity reversing switch (use both positions)
Patient connected leads
Appliance
H (Black)
POWER OUTLET
N (White)
G (Green)
H
N
G
Internal circuitry
Between each patient lead and ground
Insulating surface
Building ground
Current meter
Grounding contact switch (use in both "open" and "closed" positions)
H = Hot
N = Neutral (grounded)
G = Grounding conductor

Figure 10-7 Test Circuit for Measuring Non-Isolated Patient Leads

10-7-6-3 Dale 600 Meter Procedure

The Dale 600 provides five snap type ECG buttons for testing patient leads. Snap on all patient leads to the meter and assure that the ground clip is connected to the system's ground terminal. Select the meter's LEAD-GND function. Select and test each ECG lead positions (except "ALL") of the LEAD selector, testing each to the power condition combinations found in "PATIENT LEAD LEAKAGE" table in the "PM CHECKLIST". Record the highest leakage current measured for each Power selection.

CAUTION **Line voltage is applied to the ECG leads during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed. When the meter's ground switch is OPEN, don't touch the unit!**

Follow these steps to test the ECG module for leakage current.

1.) Turn the LOGIQ P3 unit OFF.
2.) Plug the unit into the meter, and the meter into the tested AC wall outlet.
3.) Plug the black chassis cable into the meter's "CHASSIS" connector and attach the black chassis cable clamp to an exposed metal part of the LOGIQ P3 unit.
4.) Connect the patient leads to the corresponding snaps located at the upper front of the Dale 600/ 600E. Lead nomenclature for this test is not important.

10-7-6-3 Dale 600 Meter Procedure (cont'd)

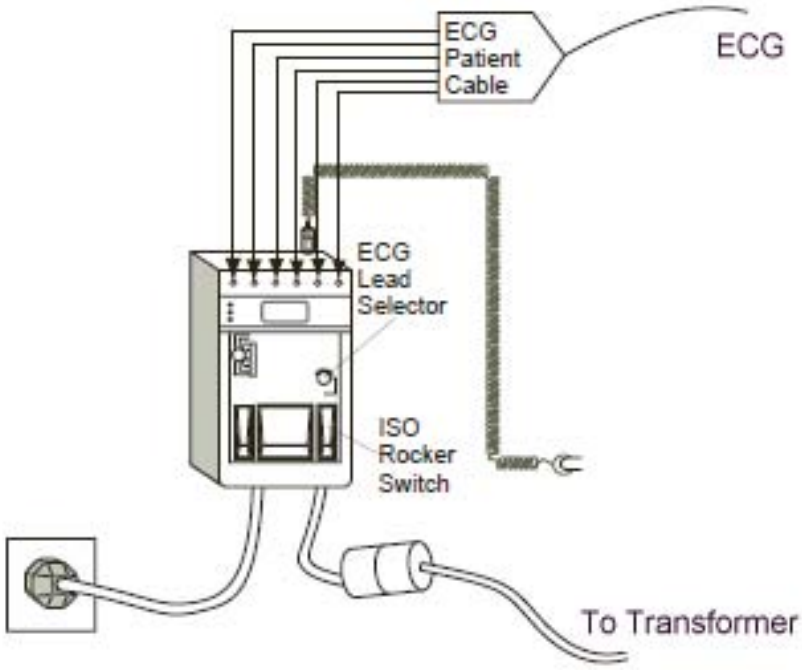

Figure 10-8 ECG Leakage Current Test

5.) Set the meter's "FUNCTION" switch to LEAD TO GROUND position to measure the patient lead to ground leakage current.

6.) Select and test each ECG lead positions (except ALL) of the LEAD selector, testing each to the power condition combinations.

Table 10-18 Testing Power Conditions

ECG Power	Meter's Polarity Switch	Meter's Neutral Switch
ON	NORM	CLOSED
ON	NORM	OPEN
ON	REVERSE	CLOSED
ON	REVERSE	OPEN
OFF	NORM	CLOSED
OFF	NORM	OPEN
OFF	REVERSE	CLOSED
OFF	REVERSE	OPEN

10-7-6-3 Dale 600 Meter Procedure (cont'd)

7.) Record the patient lead to ground leakage current measured on the data sheet.

8.) Set the meter's "FUNCTION" switch to LEAD TO LEAD position to measure the lead to lead leakage current.

9.) Select and test each ECG lead positions (except ALL) of the LEAD selector, testing each to the power condition combinations.

10.) Record the lead to lead leakage current measured on the data sheet.

11.) Set the meter's "FUNCTION" switch to LEAD ISO position to measure the patient lead isolation current.

12.) Select and test each ECG lead positions (except ALL) of the LEAD selector, testing each to the power condition combinations.

13.) Depress the rocker switch to ISO TEST and read the isolation current. To apply the voltage to the lead safely, the voltage is only applied when the rocker switch is depressed to ISO TEST.

14.) Record the patient lead isolation current measured on the data sheet.

10-7-7 Isolated Patient Lead (Source) Leakage–Lead to Lead

Reference the procedure in the IEC 60601-1. When using the Dale 600, switch the meter's function selector to the LEAD-LEAD position. Select and test each of the five ECG lead positions (except ALL) on the LEAD selector, testing each to the power condition combinations found in the table. Record the highest leakage current measured.

10-7-7-1 Dale 600 Patient Lead Tests

NEUTRAL POLARITY

1.) Closed Normal

2.) Open Normal

3.) Closed Reversed

4.) Open Reversed

10-7-8 Isolated Patient Lead (Sink) Leakage-Isolation Test

Reference the procedure in the IEC 60601-1. When using the Dale 600, switch the meter's function selector to the LEAD-ISO. Select the ALL position on the lead selector. Depress the rocker switch to ISO TEST to test lead isolation.

⚠ **CAUTION** **Line voltage is applied to the ECG leads during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed.**

NOTE: It is not necessary to test each lead individually or power condition combinations as required in previous tests.

10-7-8-1 Data Sheet for ECG Leakage Current

The test passes when all readings measure less than the value shown in the table below. Record all data on the PM Inspection Certificate.

Table 10-19 Maximum Allowance Limit for ECG Leakage Current

	AC Power Source	Maximum Allowance Limit	
		GROUND OPEN	GROUND CLOSED
Patient Lead to Ground Leakage Current Test and Patient Lead to Lead Leakage Current Test	115V	10uA	10uA
	230V	500uA	10uA

Table 10-20 Maximum Allowance Limit for ECG Leakage Current

	AC Power Source	Maximum Allowance Limit
Patient Lead Isolation Current Test	115V	20uA
	230V	5mA

Table 10-21 Typical Data Sheet for ECG Leakage Current

ECG Power	Tester Polarity Switch	Tester Ground Switch	Tester Lead Selector				
			RL	RA	LA	LL	C
ON	NORM	CLOSED					
ON	REVERSE	CLOSED					
ON	NORM	OPEN					
ON	REVERSE	OPEN					
OFF	NORM	CLOSED					
OFF	REVERSE	CLOSED					
OFF	NORM	OPEN					
OFF	REVERSE	OPEN					

10-7-9 Probe Leakage Current Test

10-7-9-1 Definition

NOTE: This test measures the current that would flow to ground from any of the probes through a patient who is being scanned and becomes grounded by touching some other grounded surface.*Some leakage current is expected on each probe, depending on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement.*
It is abnormal if no leakage current is measured. If no leakage current is detected, check the configuration of the test equipment.

10-7-9-2 Test Equipment

Table 10-22 Test Equipment kits (Chapter 10 LOGIQ P3 Service Manual)

Kit	Description	Contents
46-285652G1	Dale 601 - ULTRASOUND SAFETY ANALYZER FIELD KIT - for 120V unit	• ELECTRICAL SAFETY ANALYZER, DALE, MODEL 601 for 120V unit • Vendor MODEL 600/100 8FT CHASSIS GROUND CABLE • Vendor MODEL 600/102 6FT SALINE BATH GROUND CABLE • Vendor MODEL 600/202 ULTRASOUND PROBE ADAPTER • Vendor MODEL 600/600 SOFT CARRYING CASE • Vendor MODEL 600/900 OPERATORS MANUAL • Vendor MODEL 600/901 LMINATED OPERATORS GUIDE
46-328406G2	Dale 601E - ULTRASOUND SAFETY ANALYZER FIELD KIT - for 220V unit	• ELECTRICAL SAFETY ANALYZER, DALE, MODEL 601E for 220V unit • Vendor MODEL 600/100 8FT CHASSIS GROUND CABLE • Vendor MODEL 600/101 16FT CHASSIS GROUND CABLE • Vendor MODEL 600/103 8FT CHASSIS GROUND PROBE • Vendor MODEL 600/200 8FT EXTERNAL LEAKAGE GROUND CABLE • #20 WIRE W/MINIGATOR CLIPS, 2 Ft • CARRYING CASE and foam padding • Vendor MODEL 600/900 OPERATORS MANUAL

10-7-9-2 Test Equipment (cont'd)

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Table 10-23 Test Equipment and Accessory Description

Dale Part number	Accessory Name	Picture	Description
Vendor MODEL 600/100 46-285647P2	CHASSIS CABLE	Black coil with extended length and black grips	Used on DALE601/601E to measure earth resistance and enclosure leakage current. Also used as reference lead for external measurement.
Vendor MODEL 600/102 46-285647P4	CHASSIS GROUND PROBE	Black coil cord with needle probe for testing receptacles and for tight spaces.	Also referred to as "Saline Probe" or "Saline Bath Ground Cable". Measures earth resistance and enclosure leakage current. Also used for grounding saline baths for isolation testing of probes. Used on DALE601/601E. This probe may be substituted for the 600/100 Chassis Cable, and used as a probe instead of a clamp.
Vendor MODEL 600/200 46-285647P6	ISO/EXTERNAL LEAKAGE CABLE	Black coiled cord with red grips.	Standard auxiliary cable for external measurements of leakage current and voltage gradient between two surfaces. Used on DALE601/601E to measure: • Point-to-Point Leakage Current • Probe and Transducer Isolation Current May only be connected to the female connector of the Analyzer, labeled EXTERNAL

10-7-9-3 Generic Procedure for Leakage current

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the unit Off and On. For each combination, the probe must be active to find the worst case condition.

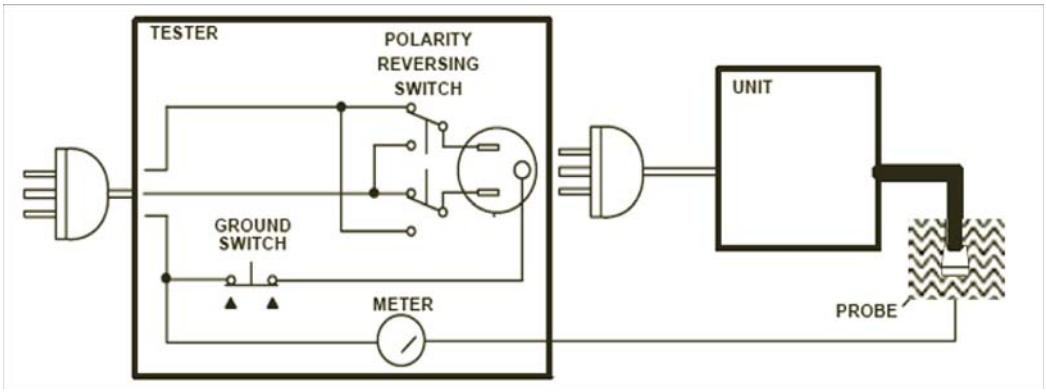

Figure 10-9 Set Up for Probe Leakage Current

NOTE: Each probe will have some amount of leakage current, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement.

10-7-9-4 Meter Procedure Using Dale Meter to Measure Leakage Current

The ultrasound probe's imaging area is immersed in a solution along with a grounding probe from the test meter to complete the current path. The solution is a mixture of water and salt. The salt adds free ions to the water, making it conductive. Use mixture of 1 Litre of H2O (water) with 9 grams of table salt, mixed thoroughly.

Follow these steps to test each probe for leakage current:

1.) Turn OFF the LOGIQ P3 unit.
2.) Plug the unit's mains power cord into the test meter, and plug the test meter into the tested AC wall outlet.
3.) Plug the Chassis Ground Probe (saline probe) into the test meter's "CHASSIS" connector.
4.) Set the test meter's "FUNCTION" switch to "CHASSIS" (Dale 600) or "ENCLOSURE LEAKAGE" (Dale 601).
5.) Connect the probe to be tested to the LOGIQ P3 unit.
6.) Put the saline probe and the probe's probe face (imaging area of the probe) into the saline bath..

⚠ **CAUTION** **To avoid probe damage and possible electric shock, do not immerse probes into any liquid beyond the level indicated in the probe users manual. Do not touch the probe, conductive liquid or any part of the unit under test while the ISO TEST switch is depressed.**

7.) Power ON the LOGIQ P3 unit.
8.) After the LOGIQ P3 unit has completed the boot process, select the probe to be tested so it is the active probe.
9.) Depress the LIFT GROUND rocker switch and record the highest current reading.
10.) Follow the test conditions described for every probe.

The test passes when all readings measure less than the values shown in Table 10-14 and Table 10-15.

10-7-9-5 Meter Procedure Using Probe Adaptor

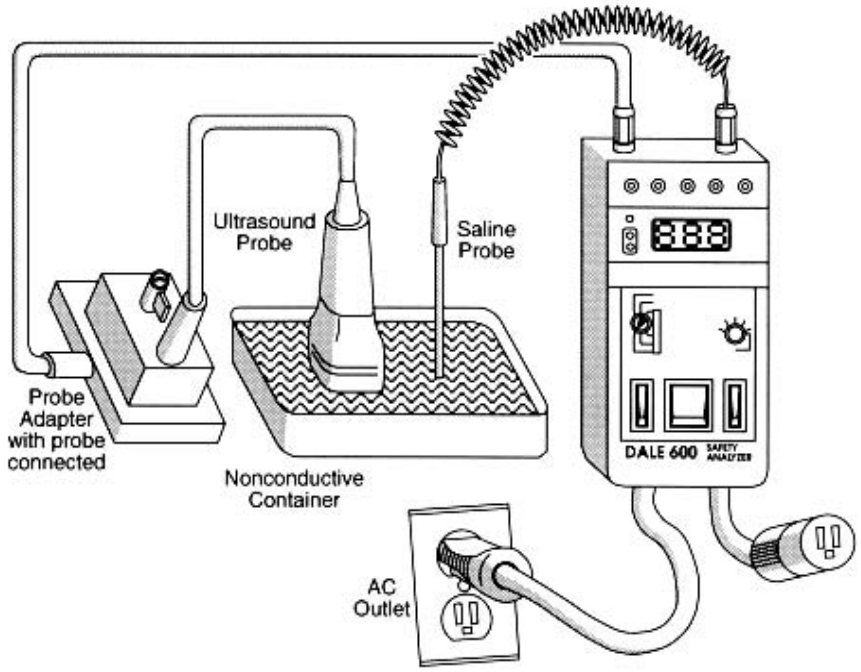

Figure 10-10 Transducer Source Leakage Current Test

11.) Set the meter's “FUNCTION” switch to EXTERNAL position.
12.) Add the saline probe and the imaging area of the probe into the saline bath.
13.) Have unit power ON for the first part; turn it OFF for the second half.
14.) Depress the ISO TEST rocker switch and record the highest current reading.
15.) Follow the test conditions described in Table 10-24 for every transducer.
16.) Keep a record of the results with other hand copies of PM data.

10-7-9-6 Data Sheet for Transducer Source Leakage Current

The test passes when all readings measure less than the values shown in Table 10-13. Record all data on the PM Inspection Certificate.

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged**

Table 10-24 Typical Data Sheet For Transducer Source Leakage Current

Transducer Tested:			
Unit Power	**Tester Power Polarity Switch**	**Tester GROUND or NUETRAL Switch**	**Measurement**
ON	NORM	OPEN	
ON	NORM	CLOSED	
ON	REV	OPEN	
ON	REV	CLOSED	
OFF	NORM	OPEN	
OFF	NORM	CLOSED	
OFF	REV	OPEN	
OFF	REV	CLOSED	

Section 10-8
When There's Too Much Leakage Current...

AC/DC FAILS

Check any broken of the AC/DC adapter and its cable. Replace a new one if any portion defective.

ENCLOSURE FAILS

Check any broken of the enclosure. Replace any defective part.

Inspect wiring for bad crimps, poor connections, or damage.

Test the wall outlet; verify it is grounded and is free of other wiring abnormalities. Notify the user or owner to correct any deviations. As a work around, check the other outlets to see if they could be used instead.

NOTE: No outlet tester can detect the condition where the white neutral wire and the green grounding wire are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

PROBE FAILS

Change another probe to confirm if the fail is caused by console.

NOTE: Each probe will have some amount of leakage, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. The maximum allowable leakage current for body surface contact probe differs from inter-cavity probe. Be sure to enter the correct probe type in the appropriate space on the check list.

If excessive leakage current is slot dependent, inspect the system connector for bent pins, poor connections, and ground continuity.

If the problem remains with the probe, replace the probe.

PERIPHERAL FAILS

Inspect wiring for bad crimps, poor connections, or damage.

STILL FAILS

If all else fails, begin isolation by removing the probes, external peripherals, then the on board ones, one at a time while monitoring the leakage current measurement.

NEW UNIT

If the leakage current measurement tests fail on a new unit and if situation can not be corrected, submit a Safety Failure Report to document the system problem. Remove unit from operation.

ULTRASOUND INSPECTION CERTIFICATE

Customer Name:		System ID:	Dispatch Number / Date Performed:	Warranty/Contract/HBS
System Type		Model Number:	Serial Number:	Manufacture Date:
Probe 1:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 2:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 3:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 4:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 5:	Frequency:	Scan Format*:	Model Number:	Serial Number:

* Scan Format: Phased Array, Linear Array, Curved Array, Mechanical Array or Other

FUNCTIONAL CHECKS

Functional Check (if applicable)	OK? or N/A
B-Mode Function	
Doppler Modes Function	
CF-Mode Function	
M-Mode Function	
Applicable Software Options	
Applicable Hardware Options	
Control Panel	
LCD	
Measurement Accuracy	
GE Approved Peripherals	

PHYSICAL INSPECTION AND CLEANING

Physical Inspection and Cleaning (if applicable)	Inspect	Clean
Console		
LCD		
External I/O		
Cables and Connectors		
GE Approved Peripherals (DVD-RW, Printer)		
Labeling (see User Manual for Labeling)		

COMMENTS:

_____

_____

_____

_____

ELECTRICAL SAFETY

Electrical Test Performed	Max Value Allowed	Value Measured	OK?	Comments
Outlet (correct ground &wiring config.)				
Type BF Applied Part Leakage Current Limits- Probe				
enclosure Source Leakage Current - Chassis Leakage Current Limits				
Peripheral 1 Leakage Current				
Peripheral 2 Leakage Current				

PROBES

Probe Number (from previous page)	Max Value Allowed	Max Value Measured	OK?	Comments
Probe 1:				
Probe 2:				
Probe 3:				

Final Check. All system covers are in place. System scans with all probes as expected.

Accepted by: _____

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Archiving Images
Move 30
B
Backup
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Preset Configurations 27
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Functional Checks 24
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CE Compliance 19
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Focal zone
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Troubleshooting
Gathering Trouble Data 2
Screen Captures 6
Trouble Image with Logs 3
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